

SUMMARY

of the doctoral thesis entitled:

RESEARCH ON THE LONG-TERM STORAGE BEHAVIOR OF BATCHES OF GRAIN CEREAL SEEDS INTENDED FOR SOWING, IN THE CONDITIONS OF GALAȚI COUNTY

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The aim of the research paper on the behavior of straw cereal varieties in conditions of conservation and storage in optimal conditions is to ensure the quality and maintenance of their longevity which expresses the duration over which they maintain their vitality, usually quantified in years or months.

The main objectives of research on the storage and storage of cereal seeds:

1. Assessment of environmental factors that influence their quality, their preservation for a longer or shorter period of time, so that the initial physical, chemical, biological and organoleptic properties are maintained unaltered and even improved, by constantly optimizing the systems of storage.
2. Evaluation of the technical measures to be applied for the channeling of physico-chemical and biological processes in the grain mass, taking into account the factors influencing the microbiological processes temperature, the composition of the atmosphere in the mass of straw cereals, the interactions between microbial species and humidity important factor in determining the activity of microorganisms. depending on its content, respectively the water activity, on straws different species of microorganism can develop.
3. Evaluation and measurement of qualitative indices of wheat conditioning and optimization of the storage process without influencing the quality of cereals.
4. Evaluation of the superiority of the Romanian Glosa wheat variety in relation to other varieties in similar storage conditions.

The paper is structured in two parts: the first part is a documented review of the current state of knowledge in the proposed field, the second part is intended to describe the material, research method, presentation of results obtained during research, conclusions derived from this research being presented in the conclusions section.

In the first part of the paper was analyzed the theoretical and normative framework "seed - essential lever in sizing grain production", and in the second part, a study was made on the application of the method of storage, storage of grain seeds, which presented the aspects significant

with a summarized journey of the main aspects of interest, study adapted to the existing situation in Galati county.

Thus, in Chapter I entitled "Current coordinates of Romanian agriculture" we treated aspects regarding Romanian agriculture through the prism of its positioning on the European market profile highlighting some dysfunctions in terms of achieving the productive goal. At the same time, we analyzed the macroeconomic context in Romania in terms of its positioning in the national economic system, focusing on issues regarding the role of sustainable development in agriculture and developing scenarios and medium and long term performance objectives on Romanian agriculture from a sustainable perspective.

In the second chapter called "The quality of seed material in cereal agriculture" we analyzed the main characteristics that determine the quality of seed material after a preamble on the identification and typological classification of seeds. The conceptual evaluation of the physical and physiological characteristics was made from the point of view of the impact characteristics during the storage period, emphasizing humidity, germination, purity and longevity. A significant aspect treated theoretically in this chapter focused on storage solutions that in the opinion of several authors generate a maintenance of quality and an increase in the longevity of the seed material. The basic principles of seed storage, storage space requirements to ensure effectiveness objectives and integrated protection of harmful storage organisms were critically analyzed.

In the second part of the paper, an experimental study was conducted on the impact of time storage on the quality of wheat and barley seed material.

In the third chapter "Study on the storage need of agricultural producers in Romania, the pedo-climatic and economic profile of Galati county and the productive agricultural capacity of the region was analyzed. The conclusions of the analysis allowed the elaboration of the SWOT diagram of the vulnerabilities regarding the regional storage capacity. We applied the conclusions for the evaluation of agricultural performance by reporting to the main producers in the region and we used as statistical benchmarks the data on the production of seed material in Galati county. The analysis was performed for a fully accredited agricultural agent with national representation (Germina Agribusiness SA) and for an accredited agricultural agent with activity in the agricultural basin of Galați County (Păunul A.N. SRL). The research showed that against the background of the vulnerability of the macroeconomic environment and the predictable instability of production capacity, both agents had to resort to numerous structural changes using reorganizations, economic restructuring, affiliations to a group of producers to increase regional representation. The study made it possible to identify a systemic problem that affects agricultural producers, namely inadequate storage without monitoring environmental factors, to ensure adequate quality of seed material to ensure its productivity.

In the fourth chapter called "Research on optimizing the storage conditions of cereal seeds" approached the research methodology by addressing some working hypotheses, then proceeding to the actual organization of research, establishing the research method highlighting the results obtained both in the field and in the laboratory regarding the behavior of lots of straw cereals (seed

material) for long-term storage with the highlighting of qualitative characteristics and optimization of the longevity of lots intended for sowing.

The actual organization of the experiments was based on the fact that in the territory of Galati County, the method of storage with the highest rate of applicability for seed lots intended for sowing, is storage in a dry state and in open warehouses, thus conducting research on the system of storage of the seeds up to a humidity below the critical humidity and keeping them, under normal environmental conditions, packaged or unpacked, in spaces which ensure the greatest possible protection against variations in humidity, temperature and other factors that may cause damage.

The experiment started in 2017 in the form of a multifactorial research, being studied in homogeneous lots, respectively: four lots of wheat seeds, from the Glosa variety, Basic and Certified categories (C1), from Germina Agribusiness SA Bucharest - CATecuci and four batches of autumn barley seeds, from the Nectaria variety, Basic and Certified categories (C1), from Păunul AN SRL.

The novelty of the experiment consists in the fact that in order to optimize the longevity (maintaining, as far as possible, unaltered, the germination capacity) and maintaining the influence of harmful organisms, below the damage threshold, -5°C , respectively, maintaining the seeds at a constant temperature of 20°C , which would stop the development and survival of harmful organisms, compared to the control variant, without the possibility of monitoring.

In Chapter V entitled "Statistical model of behavioral evaluation of analyzed seed lots subject to long-term storage" we designed a statistical model based on the need for storage previously identified, a model that allowed the behavioral evaluation of wheat variety Glosa and barley variety Nectaria at the specific storage conditions with and without monitoring the environmental conditions, obtaining information on the predictive change of the physiological characteristics in the conditions of monitoring the environmental factors that impact the quality of the seed material.

The results allowed the design of a statistical model of economic impact on the effects of storage on seed material under controlled conditions and which demonstrates the increase of economic yield under these conditions.

The paper cites a number of 142 bibliographic sources, extends over 159 pages and includes 28 tables and 127 figures, prepared by the author, by processing the information from the mentioned bibliographic sources, as well as the research results obtained during the experiment.

Agriculture is characterized by a predominantly cereal orientation, determined by the ecological suitability of the entire national territory for the growth and development of these plants, but also by the need to ensure food security of the population or the desire to trade in cereals.

The need to preserve agricultural production is determined by the gap between the seasonal nature of production itself and the quasi-permanent need for its consumption, which necessitates the need to preserve and preserve for a longer or shorter period of time, depending on the requirements of consumption staggered over time.

Preservation of seeds for sowing is an activity of maximum responsibility in ensuring food security, in order to meet the requirements [145] of the market because it is intended to preserve

unaltered, biological, physical and physiological characteristics that give them the ability of seed for sowing, throughout storage.

Contributions to the development of knowledge in the field

The research was aimed at identifying the causes that lead to the deterioration of the quality and quantity of seed material stored under certain conditions in two warehouses in Galati County.

The results of the scientific study confirm all working hypotheses, namely:

Hypothesis 1 Storage influences the quality of seeds in the sense of maintaining appropriate health indices in the case of control of storage conditions and temperature monitoring.

Hypothesis 2 Appropriate storage in the medium term increases the control of the deposits by about 40-50% depending on the quality of the seed material, observing a behavior adapted to the controlled temperature conditions, respectively reducing the storage temperature to 200C compared to the temperature resulting from the observational study which reaches on average about 250C. Thus, the percentage resulted in a decrease in losses from about 14% in the case of medium-term storage without temperature monitoring to about 7-8% in the case of controlled storage.

Hypothesis 3 Proper storage pays off in the long run for the region's productive surplus, giving operators the opportunity to benefit from the quantity and quality of seed material needed in time for seasonal multiplication.

The viability of the seed lots destined for sowing, of the wheat and barley species kept, in the long term, in the conditions of the two warehouses in Galati county, is significantly enhanced by the biological category, the results obtained highlighting the fact that in the same storage conditions Seeds of the basic organic category variety have maintained their viability for a longer period than batches of C1 certified organic category seeds. In order to optimize the viability of seed lots for sowing of straw cereal species, kept for a long time, in the dry state, in semi-open spaces, it is possible to proceed successfully, by reducing by 50 C the storage temperature and maintaining it at a value constant of 200 C, throughout the storage, a method that does not involve significant additional costs

The method is effective for seed stocks that remain from one year to the next and thus can maintain their viability for a longer