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**METHODOLOGY
of conducting field and laboratory researches with switchgrass
(*Panicum virgatum L.*)**



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The scientific publication clarifies the methodology of conducting field and laboratory researches with a new crop - switchgrass (*Panicum virgatum* L.). The necessity to improve the existing research methods with the introduced energy crop has been substantiated. The phenological phases and peculiarities of observing the growth and development of switchgrass plants during the growing season have been given. The necessity to define productivity of plants (kg/m²) with the following conversion to the yield (t/ha), taking into account the phytomass crop humidity, has been proved. The scheme of selection of sheaf samples in order to determine the crop productivity elements by quantitative indices of vegetative and generative part of plants has been presented. The peculiarities of determination of seed productivity from the sheaf samples and the methods of seed yield accounting have been defined.

The methods of determining the sowing qualities and the formulas for determining the weight and quantitative seeding rate of switchgrass have been presented.

Recommended for researchers, post-graduate students and students of specialty 201 –Agronomy.

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INTRODUCTION

At present, due to the wide specialization of agronomy and the introduction of new energy crops, there is a need for specification and detailing of the existing methods of scientific researches, preliminary search or testing them before the main experiment.

Scientific agronomy uses its own research methods. The main methods include: laboratory, vegetation, lysometry, field and vegetation-field, as well as examinations and experiments, etc. [1].

Field experiment is a research method that is carried out in a field on the specially selected area in order to establish the influence of life factors, conditions or methods of tillage on the yield of crops and other plants as well as its quality. The peculiarity of this experiment is that the crop is studied together with soil, climatic and agrotechnical factors, and often in the conditions very close to production or directly in the production conditions [2]. Using this research method, new varieties and hybrids are tested, crop rotation, the methods of soil tillage, fertilizer application, plant protection agents against pests, diseases and weeds, and many other agricultural techniques are studied. The results of field experiments are used in the development of new zonal technologies for growing crops and zoning of new varieties and hybrids.

Laboratory researches are carried out in the laboratory conditions applying special instruments and equipment. Laboratory experiments are carried out in the different laboratories, phytotrons, thermostats, etc. [3]. Laboratory experiments should be distinguished from the laboratory tests which are qualified as observations. Assessment of laboratory germination or energy of seed germination is used both for scientific and practical purposes.

The developed and approved methods, recommendations, standards, etc. are used for conducting field and laboratory researches.

Several technologies for energy crops have been created so far. Some of them relate mainly to the farming techniques [4, 5]. Other technologies focus on determining the quantitative and qualitative indices of plants in assessment of their difference, uniformity and stability [6, 7], as well as methods of determining and improving seed germination [8].

At the same time, the methods of observing the growth and development of plants, different calculations and determination of sowing and weight seeding rate of switchgrass have not been paid proper attention.

For this reason, we present the improved methodology of conducting field and laboratory researches with switchgrass (*Panicum virgatum* L.), based on our own long-term studies, and taking into account the existing methodological recommendations.