

Teaching Reform and Research of Crop Breeding Experiment

Long Jiang

College of Agronomy, Jilin Agricultural Science and Technology University, Jilin, Jilin, 132101, China

jlnykjxyjl@163.com

Keywords: Crop breeding; experiment; teaching; reform.

Abstract: In order to improve the innovation ability and scientific research practice ability of agronomy students, and cultivate qualified applied and innovative talents. According to the characteristics of crop breeding experiment course, the author and his team fully draw on the experience of experimental teaching reform of this course in other agricultural colleges and universities. Comprehensive reform and course design of crop breeding experiment were carried out from the aspects of experimental outline, training plan, teaching conditions, teaching mode, teaching plan and so on, and good teaching results were obtained.

1. Introduction

Crop breeding, one of the core courses of plant production major in agricultural universities, is the concentration and achievement of human long-term agricultural production activities and scientific experiments^[1-2]. In order to meet the basic requirements of the reform of agricultural higher education, we regard "thick foundation, large caliber, strong ability, fast adaptability and high quality" as the main direction of cultivating agricultural undergraduate applied talents^[3-4]. The author and his team have reformed part of the contents of crop breeding courses and the methods of experimental teaching in order to meet the practical needs of the rapid development of agriculture for innovative agricultural talents.

2. Construction of "Integrated three-level" experimental teaching system of crop breeding

In the process of building a new teaching system of "integration and three levels", the author and his team reiterated that the guiding ideology of experimental teaching is to emphasize the cultivation of students' comprehensive quality and students' basic skills, in order to ensure the promotion of students' innovative consciousness. Refine the experimental content (genetics experiment, plant protection experiment, crop cultivation experiment, crop breeding experiment, statistical experiment and field experiment design), which is relatively consistent with the theoretical knowledge. In this way, it not only runs through the students' understanding and understanding of the theoretical knowledge, but also cultivates the students' basic experimental skills and application ability. Therefore, we added a comprehensive experiment in the sixth semester (the second semester of the junior year), the experiment content is at least the intersection of two secondary disciplines, and at the same time carry out consolidation, deepening and applied experiments to cultivate students' practical skills and the ability to explore problems. On the basis of a wide range of basic theories and experimental skills, it can help students find corresponding jobs smoothly. It lays a partial foundation for students' further study and graduation thesis writing in the future. In addition, increase the number of professional oriented design experiments in the seventh semester (the first semester of the senior year), and pay more attention to the completion of the experiment. Deeply cultivate students' ability to understand and summarize the literature, constantly improve students' ability to analyze and deal with problems, and then cultivate students' independent innovative consciousness and research style.

3. Constantly update the teaching content

Experimental teaching is not only the assistance link of classroom teaching, but also the continuation and deepening of classroom teaching. In the process of completing the experiment, students can not only verify the knowledge acquired in the classroom through a series of activities, such as observing experimental phenomena, hands-on operation, analyzing experimental data, summarizing experimental results, but also acquire new skills and knowledge. Through the analysis of the experimental data, we can judge the authenticity of the experimental results and comprehend the successful experience and failure lessons of the experiment, which will have a great impact on the future work.

In the process of planning and practicing the experimental teaching reform, the author and his team strictly follow the principle of "attaching importance to practice and strengthening practice" to integrate the experimental content. The original single verification experiment is gradually transformed into an "innovative, basic and comprehensive" experiment. Among them, "morphological identification and ploidy breeding of plant male sterile plants", "rice cross breeding technology" and "determination of pollen vigor" all belong to basic experiments, while "compilation and implementation of breeding experiment scheme" and "comprehensive analysis test of rice quality" all belong to comprehensive experiments. The innovation experiment includes "Jilin Agricultural Science and Technology University Scientific Research Innovation Entrepreneurship training Program Project" and "Jilin Province College students Innovation experiment Project" and other experiments. Through in-depth screening and comprehensive exploration of the experimental contents, we have achieved the purpose of training students to grasp the basic experimental principles and practical skills of crop breeding experiments in detail and systematically, and taught students the skills of inquiry and innovation by using the knowledge they have learned.

4. Reforming and perfecting the examination method of experimental teaching

Experimental examination is an important way to test teaching achievements and consolidate students' knowledge, which can be used as a basis for the evaluation of experimental teaching achievements to a certain extent ^[5-6]. Agronomy College of Jilin Agricultural Science and Technology University has partially reformed the original experimental examination system, checking not only the completion of the students' experimental reports, but also the proficiency of the students' experimental operation and the completion of the experiments. In addition, prepare dozens of questions related to the experimental operation for students to extract and answer questions on the spot, through a variety of ways of assessment to improve students' interest in breeding experiments and enhance students' operational skills ^[7].

The improvement of the evaluation system helps to fully mobilize students' enthusiasm for experimental learning. Because the crop breeding experiment has relatively obvious seasonality and complexity, the author and his team have changed the previous simple classroom teaching model. The experimental course of crop breeding will be evaluated from five parts: experimental operation skills, experimental report, final exam, classroom question and answer, and scientific research attitude. In all the examinations, the proportion of experimental operation skills is the highest, mainly in order to cultivate students' own practical ability. In a word, the evaluation method will reflect the students' actual learning situation carefully, naturally and fairly, promote the students' interest in all kinds of experiments, and then stimulate the students' enthusiasm and initiative in the experimental class, which will promote the careful development of students' knowledge, skills and innovative consciousness.

5. Further strengthen the laboratory construction and improve the management system

Laboratory is an important place for experimental teaching of crop breeding. In order to successfully complete the relevant experimental teaching, the premise guarantee must be to have a well-equipped laboratory. However, with the emergence of new research methods and the

continuous deepening of crop breeding research, it is necessary to constantly improve crop breeding laboratories. It is necessary to further strengthen the laboratory construction and change the current problems of aging equipment and single function, so as to ensure the smooth progress of crop breeding experiment teaching. The laboratory should also formulate a strict and operable physical inventory system according to the actual situation, grasp the profit and loss of reagents and laboratory assets in time, implement audit procedures in accordance with the prescribed procedures, and accurately reflect the actual situation of assets, and truthfully carry out the accounting treatment of asset write-off, and truly realize the settlement of assets. In addition, the person responsible for the asset loss should be held responsible according to the specific circumstances of the asset loss^[8-9].

6. Conclusion

Crop breeding is an important course for sustainable development, and teaching reform is a long-term systematic project. The purpose of curriculum reform is to improve teaching quality, constantly cultivate students' practical ability and innovative ability, and improve students' comprehensive quality. It is also a way to explore ways to train new talents with thick foundation, strong professional quality, strong skills and high quality. It not only requires teachers to constantly reform the teaching methods of crop breeding and constantly learn the latest general knowledge of crop breeding, but also requires students to participate in the teaching reform of crop breeding, so as to promote the development of teaching reform of crop breeding^[10]. In view of the above contents, Jilin Agricultural Science and Technology University will continue to carry out more in-depth experimental teaching reform of crop breeding, in order to achieve the purpose of training all-round agricultural talents.

Acknowledgments

This paper was financially supported by 2019 General Planning Subject of the "13th Five-Year Plan" Project of Education Science in Jilin Province "The Construction of the Experimental Teaching System of "Integration in Three Levels " in Crop Breeding" (GH19260); 2019 Higher Education Scientific Research Project of Jilin Higher Education Academy "Optimization of Practical Teaching System of Seed Science and Engineering Based on Innovative Personnel Training" (JGJX2019D406).

References

- [1] WANG S Y, BI J J, WANG J H, et al. Exploration of multi-level experimental teaching of crop breeding [J]. *Experimental Science and Technology*, 2008, 6(06):94-95+108.
- [2] WANG Q B, WANG S Y, BI J J, et al. Course construction and experimental teaching reform of crop breeding [J]. *Experimental science and technology*, 2013, 11(05):82-83+127.
- [3] LI D G, FANG D G, LI Z Y, et al. Thoughts on the reform of crop breeding experiment course [J]. *Professional circle*, 2007(13):185-186
- [4] WANG C H, MU P. Discussion on experimental practice teaching reform of crop breeding in agronomy specialty [J]. *Anhui Agricultural Bulletin*, 2015, 21(21):119-120.
- [5] YU H Y, ZHANG R, PENG J Z, et al. The establishment and implementation of a three-dimensional practical curriculum teaching system centered on "integrated classroom" [J]. *Heilongjiang animal husbandry and veterinarian*, 2018(10):227-229.
- [6] LIU F, DENG L X, DONG H J. Application of task-driven method in practical teaching of veterinary surgical surgery [J]. *Heilongjiang animal husbandry and veterinarian*, 2019(04):169-171.
- [7] LI S M, WANG F J, DONG L P, et al. Problems and reform measures in experimental teaching of crop breeding [J]. *Seed science and technology*, 2018, 36(10):3+7.
- [8] SHI R X. The present situation and countermeasures of fixed assets management in colleges and

universities [J]. Management Informatization in China (Accounting Edition), 2007 (3):63-65.

[9] ZHU Q. Problems and countermeasures of fixed assets management in colleges and universities [J]. Chinese Business (second half of the month), 2010(10):241-244.

[10] LU B X, HE D H, CHEN Y. Exploration and practice of teaching reform of crop breeding course [J]. Anhui agricultural science, 2014, 42(35):12771-12772.