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Teaching Innovation and Ideological and Political Case Design of Organic Agriculture in Higher Agriculture and Forestry Colleges from the Perspective of New Agriculture

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Abstract: *Organic agriculture is an elective course for plant production-related majors such as horticulture, plant protection, and resource environment and engineering in colleges and universities of agriculture and forestry. It plays a crucial role in enhancing students' comprehension of advanced ideas and technologies in agricultural production and cultivating compound and application-oriented senior talents in agriculture and forestry. To strengthen the supporting and promoting effect of characteristic courses of agronomy on the cultivation of professional talents, this paper takes the horticulture major as an example. In combination with the advantages and characteristics of the horticulture major, it analyzes the pain points in the teaching of the organic agriculture course, as well as the necessity of teaching innovation and the reform of ideological and political education in the curriculum under the background of the new agricultural science. On this basis, in view of the teaching pain points of the "Organic Agriculture" course, as well as the professional background and psychological characteristics of the teaching objects, a learning situation analysis is conducted. The teaching objectives of this course are closely combined with the talent cultivation objectives of the horticulture major, and the basic ideas for the reform of the "Organic Agriculture" course in the context of the new agricultural science are proposed. Corresponding innovative ideological and political education cases are designed for the teaching content of different chapters, to improve the teaching effect of the course, giving full play to the moral education effect of this course, enhancing the supporting and supplementary role of the organic agriculture course in the talent cultivation objectives of the horticulture major, and providing references for the teaching innovation and ideological and political reform of agricultural courses in agricultural colleges and universities.*

Keywords: *Organic agriculture; New agricultural science; Curriculum ideology and politics; Teaching innovation and practice; Teaching case design*

1. Introduction

Food is the paramount necessity for the people. Agriculture constitutes the cornerstone and fundamental element concerning the national economy and people's livelihood, national development, and social stability [1]. Facing new agriculture, new rural areas, new farmers, and new ecologies, the modernization of agriculture and rural areas in China urgently demands innovative and compound-applied talents in agriculture and forestry. On November 13, 2018, Wu Yan, the director of the Higher Education Department of the Ministry of Education, stated at the "Work Conference on Undergraduate Education in Yunnan Province in the New Era" that the construction and development of new engineering, new medicine, new agriculture, and new liberal arts should be expedited. The new agricultural science specialities encompass new specialities urgently needed in new industries and business forms such as smart agriculture, agricultural big data, leisure agriculture, forest health care, and ecological restoration. In September 2019, the General Secretary of China emphasized that "China's modernization cannot be achieved without the modernization of agriculture and rural areas, and the key to the modernization of agriculture and rural areas lies in science and technology and talents." In the same year, the Ministry of Education fully initiated the construction of new agricultural science, emphasizing the permeation of ideological and political education throughout the entire process of talent cultivation. It required agricultural and forestry colleges and universities to benchmark against the new requirements of the

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development of the primary, secondary, and tertiary industries such as production, processing, and circulation services in rural areas and promote the reform of teaching and the curriculum system [2], signifying that the reform of higher agricultural and forestry education in China has entered a new stage.

The new agricultural science starts by integrating into the global technological revolution and industrial transformation, and takes serving the national strategic needs of rural revitalization, ecological civilization, beautiful China and healthy China as the guidance, and focuses on solving the key issues of agricultural and rural modernization. It takes scientific and technological innovation as the basis, and takes personnel training as the fundamental, and knowledge, profession, personnel training, organization and governance system as the dimensions. To develop and restructure the agricultural higher education system facing the new era. Therefore, the construction of new agricultural science is not only the development reform of higher agriculture and forestry education to meet the needs of agricultural modernization but also the need for sustainable agricultural development. Curriculum thought and politics is an important starting points to realizing value shaping and moral cultivation [3]. This paper takes the course "Organic Agriculture" as an example, aiming at the pain points of the course, aims to explore the ideas of teaching innovation and ideological and political case design of this course, and the specific cases and implementation paths of innovation and ideological and political reform, so as to provide new ideas for agricultural curriculum innovation and ideological and political reform in agricultural and forestry colleges.

2. An analysis of the characteristics and teaching pain points of Organic Agriculture in higher agriculture and forestry colleges under the background of new agricultural science

The green and efficient development of agriculture needs to rely on the cross-disciplinary knowledge of modern biotechnology, information technology and engineering technology as support. Organic agriculture is an important agricultural production mode newly developed in recent years. It is a combination of traditional agriculture, innovative thinking and science and technology. It is conducive to protecting our shared living environment and promoting fairness and harmony among all things in the world, including human beings. Organic agriculture is an important production mode related to food security, ecological civilization, human health and rural revitalization, and sustainable agricultural development. Organic agriculture is highly consistent with the connotation of "new agricultural science", and is closely related to agricultural scientific research and the development and application of new agricultural technologies. The development of organic agriculture is closely related to China's rural revitalization, human health and sustainable agricultural development, and has strong practicality. It is a good carrier for ideological and political education. It can cultivate students' feelings of learning about agriculture, enhance their awareness of ecological civilization protection, and strengthen agriculture and rural development with a sense of historical responsibility and mission, which is of great significance to the cultivation of composite applied and innovative agricultural and forestry talents. Organic Agriculture has become a characteristic course of horticulture, plant protection, resources, environment and engineering under the background of new agricultural science in higher agriculture and forestry colleges.

However, in the higher agriculture and forestry colleges, there is a common problem that the students of agriculture majors do not have deep feelings about "agriculture, rural areas", they do not love agriculture although they learn agriculture, and they are unwilling to engage in agriculture-related work after graduation. In the previous organic agriculture teaching process, students generally have problems such as weak learning interest, insufficient learning motivation, poor learning effect, lack of understanding of the development status and trend of organic agriculture, and lack of ability to analyze and solve practical problems of organic agriculture production. By means of a questionnaire survey, student interview, classroom interaction, course paper review and other means, the author believes that this is mainly because the teaching content of Organic Agriculture is not closely integrated with the core curriculum content of the horticulture major, the development of the horticultural plant-related industries is not closely integrated with agricultural science and technology. Therefore, it can not support the cultivation goal of horticultural professionals and promote the achievement of the cultivation goal of composite applied agriculture and forestry talents.

3. The basic ideas of teaching innovation and ideological and political reform of Organic Agriculture in higher agricultural and forestry colleges under the background of new agricultural science

To meet the characteristics and needs of new agricultural construction, this paper takes the

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horticulture major as an example, based on the development needs of modern urban agriculture and forestry, and highlights the characteristics of a horticulture major. We take “cultivating morality and cultivating student” as the fundamental task, and aims at cultivating innovative composite applied agricultural and forestry talents, and focuses on the training objectives of horticulture professionals and the training needs of urban composite applied agricultural and forestry talents. Integrating into the ideological and political education goals of ecological environmental protection consciousness, conservation consciousness, resource recycling consciousness, integrity consciousness, national feelings and mission responsibility, and combining the course content with ideological and political elements, we excavate and design the scientific frontier-related to organic agriculture, organic planting and management technology of horticultural products, and the application of new agricultural technologies in organic agriculture. We introduce the typical cases of organic agriculture development at home and abroad and optimize the teaching design on this basis. For example, the organic cultivation and management methods of horticultural plants, soil fertilizer technology, disease and pest prevention technology, etc. are compared with non-organic agricultural production methods. Moreover, rain class was used to enhance real-time interaction between teacheres and students. Finally, these teaching innovations are designed to stimulate students’ learning interest, enhance students’ sense of mission to strengthen agriculture in China, and cultivate students’ independent learning ability. In this process, students could clarify the core technology and core ideas in the production management process of organic agriculture. Consequently, teaching objectives were achieved. At the same time, the supporting and complementary role of organic agriculture courses in the cultivation of horticultural professionals was also promoted.

4. Specific path and case design of teaching innovation and ideological and political reform of Organic Agriculture under the background of new agricultural science

4.1. Practicing Ecological Civilization Education and Patriotism Education Based on the Safety of Agricultural Products, Environmental pollution, and Soil structure damage problems

In 2018, the Ministry of Education, the Ministry of Agriculture and Rural Affairs, and the National Forestry and Grassland Administration proposed in the document on Strengthening the Combination of Agricultural Science and Education and Implementing the Education and Training Plan for Outstanding Agriculture and Forestry Talents 2.0 that “higher agriculture and forestry education should establish and practice the concept that clear waters and lush mountains are gold and silver mountains” and adhere to the harmonious coexistence of man and nature [4]. The importance and significance of developing organic agriculture are drawn from the problems of quality and safety of agricultural products and environmental pollution caused by the abuse of chemical fertilizers and pesticides. We know that green water and green mountains are the golden mountains. Combined with the agricultural development policy and trend of our country, we guide students to realize that Organic Agriculture is the direction of sustainable development of agriculture. Through studying the successful cases of developing organic agriculture in developed countries abroad, students are inspired to have a sense of historical responsibility for strengthening agriculture; Through learning biological control, physical control, agricultural control and other pest control strategies and technologies of organic agriculture, as well as learning intelligent organic agriculture production cases, students can feel the power of science and technology and the importance of science and technology in agricultural development; By learning the secrets of the prosperity of traditional Chinese agriculture, such as crop rotation, intercropping, intercropping and other planting patterns, students will realize the secrets of the prosperity of traditional Chinese agriculture, and the essence of Chinese agricultural technology for thousands of years will gradually be recognized by the world, which will stimulate patriotic feelings, enhance historical and cultural confidence and national pride.

4.2. Designing Ideological and Political Cases to Enhance Professional Literacy Based on the Development Needs of the Horticultural Industry

In 2018, the Ministry of Education, the Ministry of Agriculture and Rural Affairs, and the National Forestry and Grassland Administration proposed in the document on Strengthening the Implementation of the Education and Training Plan for Outstanding Agriculture and Forestry Talents in Combination with Agricultural Science and Education 2.0 that it is necessary to cultivate outstanding agriculture and forestry talents who serve "prosperous industry, livable ecology, civilized village style, effective governance, and prosperous life". Through the construction of a new model of collaborative innovation

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and education of "profession and industry", "profession and industry" and "profession and enterprise", the docking of profession and industry is promoted, the connection between universities and enterprises is strengthened, and the collaborative education of science, research and industry is finally promoted [4]. Take the production and management technology of horticultural plants as an example, we excavate ideological and political elements and design ideological and political teaching cases to strengthen the connection between course learning and professional quality improvement. Especially, comparing the differences between the organic cultivation of apples and other cultivation modes, and the differences in pest control and soil management, enhancing effectively the supporting and complementary role of the Organic Agricultue course for the promotion of horticulture major learning. Moreover, we guide students to realize that in the face of great changes in the structure of the agriculture and forestry industry brought about by the revolution of agricultural technology, leading to them realizing that they should make full use of their professional advantages to solve practical problems. In addition, we focus on cutting-edge innovative technologies in the field of agriculture, key technologies in the field of agriculture and neck technology, such as the modern seed industry, and excavating ideological and political cases. For example, we take organic agriculture in Beijing as an example to analyze the production management technology and development status of organic vegetables and organic farms, to strengthen students' interest and sense of learning harvest in the subject.

4.3. Designing Science and Technology Related to Organic Agriculture, Rural Revitalization of Ideological and Political Cases to strengthen value leadership and Shaping

The construction of new agricultural science adheres to the value guidance, adheres to the demand guidance, and trains the talents demanded by the experimental new agricultural science industry [5]. Organic agriculture is closely related to rural development, farmers' main interests and agricultural development, which makes students realize the significance of developing organic agriculture for rural revitalization. Through the organic integration of key technologies of organic agriculture with professional characteristics and production practices, students can actively develop towards the direction of composite application-oriented outstanding talents who are "proficient in majors and good at innovation" [6]. By integrating into the forefront of agricultural development science and technology, students can realize the importance of rejuvenating the country through science and technology in the development process of organic agriculture, improve students' professional self-confidence and professional identity, and improve students' awareness of knowing and loving agriculture and the sense of mission of strengthening agriculture.

The General Secretary of China wrote in his reply to the students of the Primary School of Science and Technology of China Agricultural Leaf University: "Closely combine classroom learning with rural practice, cultivate the feelings of love for agriculture, cultivate the ability to rejuvenate agriculture, make contributions to the big stage of rural revitalization, and contribute youth to accelerate the modernization of agriculture and rural areas and comprehensively build a modern socialist country" [7]. Taking college student Zou Zilong's participation in rural revitalization as an example, this paper explores ideological and political elements and does teaching design to stimulate students' feelings about agriculture, agriculture and agriculture, enhance students' knowledge and love of agriculture, enhance the driving force of participation in rural revitalization, and cultivate horticultural professionals who understand agriculture and love agriculture.

4.4. Designing Ideological and Political Cases of Organic Agriculture at Home and Abroad to Strengthen Responsibility and Feelings of Home and Country

Centering on the development gap in organic agriculture and the difference in organic agriculture standards between China and foreign countries, we will cultivate students' international vision and stimulate students' sense of social responsibility. Through the development status and successful cases of organic agriculture in other countries, students are guided to think about the gap between the development of organic agriculture in China and abroad and to inspire students' sense of responsibility and feelings of home and country. It is suggested that students can learn from the experience of organic agriculture development in Western countries, but they should consider the specific actual situation of our country. With the domestic and international standards and certifications of organic agriculture production as the starting point, students should cultivate the values of moral integrity.

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4.5. Designing Organic Agriculture Ideological and Political Cases Based on National Development Strategy to Strengthen Professional Identity and Confidence

Organic agriculture is not only the improvement of food quality but also the need for sustainable agricultural development and ecological environmental protection. Organic agriculture is the bottom line thinking of our country to deal with the trade war in 2018. For example, 70% of the raw materials in the process of fertilizer production still rely on imported fossil fuels, which may face the risk of interruption at any time, so students have a deep understanding and thinking of our national agricultural development strategy so that they can apply what they have learned and combine theory with practice.

Based on the above ideas of teaching innovation and ideological and political reform of the Organic Agriculture curriculum, the case bank of teaching innovation and ideological and political reform design is shown in Table 1.

4.6. Establishing a Diversified Curriculum Evaluation Mechanism to Strengthen the Ability and Quality of Training

The construction of new agricultural science focuses on cultivating students' interest in learning and scientific research, innovative spirit and creativity, and strengthens the cultivation of students' self-study ability, induction and summary ability and expression ability [8]. By carrying out the organic agriculture science popularization speech contest and organic agriculture short video science popularization contest, we can stimulate students' interest in learning, mobilize students' subjective initiative in learning, and exercise students' comprehensive quality and ability. By consulting materials, making PPT, researching, analyzing, discussing and summarizing, students can make speeches, audio and video recordings, etc. It significantly enhanced the cultivation of students' self-learning ability, literature review ability, expression ability and other comprehensive qualities and abilities; Through the classroom interactive question and answer, fully mobilize students' learning subjective initiative and classroom attention; The course paper focuses on the problems in organic agriculture production, conducts research, analysis and discussion, and cultivates the student’s ability to combine theory with practice, discover and solve problems. The course assessment adopts multiple evaluation methods such as speech contests, short video contests, course paper writing, and classroom interactive question and answer, which strengthens the process assessment and significantly improves the assessment mechanism and evaluation system of the course.

Table 1: “Organic agriculture” teaching innovation case base.

Knowledge objectives	Ideological and political education objectives	Ideological and political case design
Organic agriculture development background	①Pay attention to environmental pollution, food safety and life and health. ②Enhancing awareness of the importance of sustainable agricultural development.	①Food safety cases, including cases of soil structure damage and environmental pollution caused by excessive use of chemical fertilizers.
Origins of organic agriculture	①Understanding the wisdom of traditional Chinese agriculture. ②Building self-confidence in culture and history. ③Making full use of time and space resources.	①Learning about high-input, high-yield “oil agriculture” (the historical background of organic agriculture). ②The traditional agricultural using intercropping, intercropping and crop rotation in China has improved agricultural production efficiency, as well as using human and animal manure and all agricultural production waste to produce organic fertilizer. ③Petroleum agriculture causes soil structure damage, soil fertility decline, soil desertification, salinization intensification, global vegetation reduction, and environmental pollution.
Four principles of organic agriculture	①Protecting the ecology and earth. ②Respecting and care for life.	①The stability of an ecosystem determines its sustainable development. ②Introducing well-known organic farm cases

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		in Taiwan China and Beijing.
Concept and characteristics of organic farming	①Enhancing awareness of ecological and environmental protection.	①Food safety incidents in recent years. ②Case of ecological destruction.
Relationship between organic agriculture and rural revitalization	①Strengthening awareness of developing agriculture through science and technology. ②Strengthening students' feelings of knowing and loving agriculture.	①College students set up organic farms and recall entrepreneurial examples. ②Smart agriculture and organic agriculture combined application case.
Soil fertilizer technology for organic agriculture	①The nutrients that man takes from the land must be returned to the land.	①Types and mechanisms of organic fertilizers. ②Organic cultivation and management technology of fruit trees and vegetables.
The important role of soil microorganisms	①Small body, big role！ ②Solving the problem by addressing the main contradiction.	①Species, functions, and mechanism of soil microorganisms. ②Application cases of soil microorganisms in agriculture.
Pest control in organic agriculture	①Cultivating students' patriotic consciousness. ②Guiding students to pay attention to the ecological environment.	①Using natural enemies to control pests; ②Interplanting repellent plants to control pests and diseases. ③Developing extracts to control diseases and insect pests by utilizing abundant Chinese herbal plant resources in China.
Organic agricultural product certification	①Strengthening students' sense of integrity. ②Strengthen students' sense of responsibility and responsibility.	①Organic agricultural products emphasize process certification rather than result certification. ②Comparing the difference between organic agricultural products and pollution-free food and green food. ③Laws related to organic agriculture. ④Organic certification standards.

5. Conclusions

Based on the cultivation goal of horticultural professionals in higher agriculture and forestry colleges, this paper aims at the teaching pain points of Organic Agriculture, condenses the teaching innovation concept of this course, clears innovative ideas, and combines the teaching content of the course with the key issues in the development of agriculture, the frontier of scientific development in agriculture, the latest science and technology in agriculture, and typical cases in the development of agriculture. Building a case base of innovation and ideological and political reform aims to stimulate the learning interest in this subject and improve the practice and innovation ability of students, ultimately realizing the unification of knowledge imparts with “moral cultivation” and “leading growth”.

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