Weeding Method of Traditional Chinese Medicine Planting Based on Big Data Analysis

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Abstract. With the continuous development of China's society and economy, China's various high-tech science and technology are constantly applied and updated in our daily life, and the level of infrastructure construction in our country has been constantly improved. In this era of big data, the application of big data technology has successfully reduced the pressure of people in work and study. The research on the methods of planting and weeding of traditional Chinese medicine has been highly concerned by people from all walks of life. The application range of traditional Chinese medicine is very wide. It can not only be used in the treatment of diseases, but also in health care and agriculture. In order to better help the research of weeding methods in traditional Chinese medicine planting in the new era, this paper puts forward the application of big data technology in the research of weed control methods of traditional Chinese medicine planting. Through the analysis method of big data, this paper analyzes some problems that need to be solved in the current development of traditional Chinese medicine planting and weeding, so as to formulate a set of research scheme of traditional Chinese medicine planting and weeding methods based on big data analysis in this era. Through the analysis, the method proposed in this paper successfully provides a new development idea for the research of weed control method of traditional Chinese medicine based on big data analysis.

Keywords: Science and Technology, Infrastructure Construction, Big Data Technology, Chinese Medicine Planting

1. Introduction
In the field of traditional Chinese medicine, many scholars have discussed the application of TCM theory, clinical practice and TCM development in various specialties by analyzing the characteristics of big data [1-3]. The research objects involve the analysis of academic innovation, opportunities and challenges in the field of traditional Chinese medicine in the era of big data. The application of TCM informatics in the field of information, feature analysis, data collection and data management, and data management are discussed According to integration analysis, data integration, disease prevention, diagnosis, treatment and health management in the process of TCM treatment, discovery of TCM
knowledge and development of new drugs, exploration of new models of TCM efficacy evaluation, TCM hospital construction based on big data platform, TCM Hospital Association, etc. Generally speaking, the research on big data of traditional Chinese medicine [4-6] is still in the initial exploration stage, lacking the development of the subject technology and the lack of adaptation to the characteristics of the discipline. At present, the hot spot in this field is to establish a big data platform, so as to integrate, analyze and share TCM data.

In recent years, China has vigorously promoted the cultivation techniques of Chinese herbal medicine, enriching the types of agricultural cultivation. As we all know, the purpose of planting Chinese herbal medicine is to provide better medicinal materials. Therefore, the cultivation of Chinese herbal medicine should not only meet the market demand, but also have strict requirements on the quality of Chinese herbal medicine. Because Chinese herbal medicine has its own characteristics, there is a lot of precipitation in the season, and weeds grow. How to control the cultivation of Chinese herbal medicine has become an important problem in the cultivation of Chinese herbal medicine. Traditional planting methods not only take time, but also cannot achieve good results by artificial weeding [7-8]. In the process of planting Chinese herbal medicine, chemical herbicides can not only improve the efficiency of weeding, but also ensure the quality of weeding. However, due to the special role of chemical herbicides, we should pay attention to whether it is harmful to Chinese herbal medicine and whether it reduces the production of Chinese herbal medicine.

With the continuous development of China's economy and society, the development of all walks of life must be closely combined with the development characteristics of the times to adapt to the needs of the times, in order to better develop in this era. In order to better help the research on weeding methods of traditional Chinese medicine planting [9-10] in the new era, this paper proposes the application of big data technology in the research of weed control methods of Chinese medicine planting. Through the analysis method of big data, some urgent problems in the development of Chinese medicine planting and weeding are analyzed, so as to formulate a set of traditional Chinese medicine planting and weeding method which is most suitable for big data analysis in this era the project of grass method research. Through the analysis, the method proposed in this paper successfully provides a new development idea for the research of weed control method of traditional Chinese medicine based on big data analysis.

2. Research on Weeding Method of Traditional Chinese Medicine Planting Based on Big Data Analysis

2.1 Big Data Technology
There is no consensus on the definition of big data. Some researchers, from a subjective point of view of human data processing capabilities, believe that big data is a data set, beyond the data processing capacity and volume of the existing human data system. For example, Wikipedia defines big data as "data set". It takes more time to capture, manage and process data by using common software tools. McKinsey research report defines big data as "a data set beyond the ability of typical database software tools to capture, store, manage and analyze data"; NIST According to the National Institute of standards and technology, big data "refers to capacity data, acquisition speed or representative data. It limits the ability of traditional relational analysis and processing data, and needs to adopt horizontal expansion mechanism to improve processing efficiency.

2.2 Weeding Methods of Traditional Chinese Medicine Planting
When two or more herbicides are used at the same time, the mixing ratio, application time and spraying technology should be strictly controlled, and whether there is resistance or other side effects between the two should be considered. A small amount of herbicides can be used for miscibility test. In case of sedimentation, flocculation, stratification, floating and deterioration, their safety has changed and cannot be mixed. In addition, attention should be paid to the synergistic effect of the mixture. For example, a mixture of chlorpyrifos and chlorpyrifos is more effective than the sum of
each single agent. In use, the dosage of mixture should be reduced, generally within half of the dosage of each agent, in order to avoid drug damage and ensure the safety of medicinal materials.

Table 1. Different planting techniques of traditional Chinese medicine in China

| Comparison project      | Drug residues       | processing time               | Safety and convenience                                | Long term use                                                                 |
|-------------------------|---------------------|--------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------|
| Weeding by medicament   | There is residue, or serious residue | It takes a long time and cannot be planted immediately after treatment | Chemicals are harmful to human health; special training is needed | The residue of drugs in soil is serious, so it is not suitable for planting. It will not affect the structure and physical and chemical properties of soil. |
| Physical weeding        | No residue          | It can be planted directly    | No danger; easy to master                              |                                                                              |
| Ecological weeding      | No residue          | Duration                      | Difficult to learn and master                         |                                                                              |
| Biological weeding      | No residue          | Duration                      | Difficult to learn and master                         |                                                                              |

3. Experimental Background and Design

3.1 Experimental Background

Up to now, the main control methods of weeding in traditional Chinese medicine planting in China include mechanical weeding, chemical weeding, biological resource weeding and ecological protection weeding. In some areas, manual weeding is still used. Artificial weeding is a labor-intensive, time-consuming, low-efficiency, low-cost way of weeding. In the context of social development, scientists have studied different agricultural weeding techniques.

3.2 Experimental Design

After being absorbed by plants, some minor factors will be formed, which will interfere with the normal growth of crops such as traditional Chinese medicine. After the herbicides are absorbed by some useless weeds, the process of life metabolism and material exchange such as energy activities is the differential process of removing waste and absorbing nutrients. If some important parts of metabolism are blocked or destroyed, life will stop or be inhibited. The use of herbicides will hinder and destroy the important links of these weeds, make the physiological and biochemical imbalance, prevent or inhibit the growth of weeds, so as to achieve the purpose of weeding. The results are as the table 1 shows.

4. Discussion

4.1 Analysis on the Research Status of Weeding Methods of Traditional Chinese Medicine Based on Big Data Analysis
At present, chemical control is still the most important method in the field of traditional Chinese medicine. However, if used improperly, it will cause pesticide residues, environmental pollution and weed resistance. When using chemical pesticides, try not to use those that cannot be used; those that can use a small amount of drugs should be used as little as possible; those that can be treated at the same time should be treated as much as possible; or if other prevention and control methods can be adopted, other prevention and control methods should be adopted as far as possible. In short, it is better to reduce the frequency of drug use, which can only be achieved at critical times when drugs are needed. In the control of weeds, different treatment methods should be adopted according to their characteristics. It can save cost, is completely reliable and has good control efficiency. The proportion of herbicides used in the cultivation of traditional Chinese medicine in China was investigated; the results are shown in Figure 1.

As shown in Figure 1, the proportion of herbicides used in the cultivation of traditional Chinese medicine in China is 55% for field application, 31% for oxyfluorfen, 10% for quizalofone, and 4% for zeetaron. Through the analysis method of big data, it is determined that the above several herbicides are the main weeding chemical agents for planting and weeding of traditional Chinese medicine in China at present. The four herbicides shown in the figure are more popular herbicides in China. When using, the soil must be flat, and there should be no large soil or plant residues, so as to avoid affecting the efficacy. Irrigation is strictly prohibited in rainstorm weather.

Because it grows in a basically sterile environment with few weeds, the safety and reliability of traditional Chinese medicine planting sources are guaranteed. Physical weeding can reduce the chemical residues in traditional Chinese medicine products without polluting the environment. Compared with chemical treatment, physical weeding can meet the requirements of organic Chinese medicine production, save time, reduce labor intensity and greatly improve work efficiency. To a certain extent, it has the advantages of no pollution to the environment and high efficiency. At the same time, it also avoids the limitations of other weeding technologies. Compared with herbicides, herbicides have the advantages of less environmental pollution and sustainable development. Investigation and Research on the proportion of weeding technology applied to new Chinese herbal medicine in our country were carried out. The findings are shown in Figure 2, of which I means foam weeding, II means steam weeding, III means infrared radiation weeding, IV means flame weeding, and V represents microwave radiation weeding.

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**Figure 1.** Proportion of herbicide application in planting of traditional Chinese Medicine
Figure 2. Application proportion of new weeding technology in Chinese traditional medicine planting

As shown in Figure 2, the proportion of herbicidal technology applied to new Chinese herbal medicine is respectively 35% of the proportion of foam weeding, 25% of steam weeding, 20% of infrared radiation weeding, 15% of fire weeding, and 5% of microwave radiation weeding. Compared with different physical weeding methods, different weeding technologies have different heat transfer mechanism and action range. In terms of weeding: flame weeding will cause the temperature of upper soil to rise, and infrared radiation will produce insulation layer near the soil surface. In insecticidal aspect: infrared and steam weeding devices do not directly heat the stems of weeds, but release heat evenly. The development prospect of flame weeding is better than that of steam weeding and infrared radiation weed treatment. It is suitable for Chinese medicine planting weeding, potato and other crops that need precise control. Steam installation also has great potential in pest control.

4.2 Prospect of Research and Development of Weeding Methods of Traditional Chinese Medicine Based on Big Data Analysis

With the continuous use of chemical herbicides, weeds in the field are no longer difficult to plant. However, due to many factors affecting the weeding effect, many herbicides cannot achieve the effect of weeding, and are mistaken as fake products. Therefore, before using chemical herbicides, we should carefully read the instruction manual and attention items, be familiar with the method of using special chemicals, and avoid using mistakes and affecting the efficacy. Environmental factors include soil conditions (such as soil texture, soil moisture, soil preparation quality, etc.) and climatic conditions (such as temperature and humidity). Therefore, in order to ensure the quality of weeding, we must strictly follow the instructions of herbicides.

Up to now, the treatment process of Common Weeds in traditional Chinese medicine planting in China can be divided into the following stages: first, soil preparation and prevention. Crop planting should try to choose the place with less weeds on the path, and herbicides can be used to kill weeds, especially perennial weeds. In order to induce weeds to germinate, film mulching and other measures should be taken before sowing, because most weeds have a long germination period. Secondly, we can control weeds before sowing. In the production practice of many crops, it is found that pre sowing is a very important period of weed control in crop planting. The third is weeding after sowing, before bud and seedling stage. Some crops take a long time from sowing to emergence. We can use herbicide sealing to control some weeds. Finally, weed control was carried out after emergence. This is the most commonly used method in agricultural production. In the growth stage of crops, especially before ridging, weeds have obvious competitive advantages. At this time, artificial weeding or appropriate herbicides were mainly used in lotus leaf treatment.

Before using herbicides to control weeds, different crops and weeds need to choose the right herbicide. The growth period of crops and weeds is the most important factor to determine the
application time of herbicides, which can not only ensure the safety of crops, but also improve the weed control effect. The application procedure of different herbicides is different. Liquid drift should be avoided during spraying, so as to avoid pesticide damage to nearby crops. According to the prescribed herbicide dosage, under different weather conditions, appropriately increase or reduce the amount of herbicide, increase or reduce the frequency of herbicide use, but not too random.

5. Conclusions
If you want to keep pace with the development of big data, you must use big data to analyze the development of traditional Chinese medicine. In this paper, the traditional Chinese medicine planting weeding technology has been better developed after the application of big data analysis method. In the new era of traditional Chinese medicine planting, a large number of weeding technology has been applied, which has successfully reduced the pressure of traditional Chinese medicine planting and some agricultural planting. Reasonable application of these weeding techniques can greatly improve the planting quality of traditional Chinese medicine. Through the integration of traditional weeding technology and modern science and technology, a set of most suitable weeding technology of traditional Chinese medicine planting is developed. In the analysis, it can be found that the research method proposed in this paper successfully provides a new research idea for the weed control method of traditional Chinese medicine planting based on big data analysis.

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