

Analysis of soil fertilizer laboratory quality control methods

Longfei Xia^{1,2,3,4,5}, Zhao Wang^{1,2,3,4,5}

¹Institute of Land Engineering and Technology, Shaanxi Provincial Land Engineering Construction Group Co., Ltd., Xi'an 710075, China;

²Shaanxi Provincial Land Engineering Construction Group Co., Ltd., Xi'an 710075, China;

³ Key Laboratory of Degraded and Unused Land Consolidation Engineering, Ministry of Natural Resources, Xi'an 710075, China;

⁴Shaanxi Provincial Land Consolidation Engineering Technology Research Center, Xi'an 710075, China;

⁵ Land Engineering Quality Testing of Shaanxi Land Engineering Construction Group Co., Ltd. , Xi'an 710075, China

Abstract

In With the continuous progress of society, soil fertilizer testing system is also gradually improved. But in the actual working process, soil fertilizer testing laboratory quality control still has some shortcomings that need to be improved. laboratory quality control still has some shortcomings that need to be improved. Therefore, we should take scientific measures to improve these shortcomings, to find ways to improve the quality control of soil fertilizer laboratory. We should take scientific measures to improve these deficiencies and find ways to improve the quality control of soil fertilizer laboratories.

Keywords

Soil fertilizer; laboratory; quality control; methods.

1. Introduction

Soil fertilizer testing work needs to set up a special laboratory, for the need to test the soil for measurement, record the number of fertilizer contained in the soil, for subsequent planting to provide the required nutrients. Only to ensure the accuracy of soil fertilizer test results, in order to better understand the nutrients in the soil, for the subsequent work to do a solid foundation.

2. Soil fertilizer laboratory quality control points

In the selection of samples need to choose those more common samples for a variety of samples for testing, so that the test results are scientific. Storage of samples must be clean, no pollution, so as not to affect the results of the experiment. In the baseline testing process, the need for testing personnel in accordance with the relevant provisions of the test, only the test personnel have professional knowledge and skills, a full understanding of the soil testing methods, in order to better meet the requirements of the test. If the laboratory personnel do not have the basic laboratory skills, it will lead to the operation process is not in accordance with the operating specifications, affecting the accuracy of the experimental results. Therefore, the laboratory staff need to understand the basic fertilizer test knowledge, and can fully utilize the laboratory equipment, in the use of the process to ensure that their own operation of the scientific, which can also further extend the service life of the equipment. In general, the laboratory testing personnel need to undergo specialized training, only to obtain the

corresponding qualification certificate, to be able to better invest in the laboratory testing process.

The instruments used by the inspector need to be regularly checked, well maintained, improve the service life of the instrument, reduce the economic expenditure of the laboratory, to ensure that the instrument can run reasonably, to ensure that the results of the experiments and tests of the scientific nature of the results. The environment of the laboratory needs to be kept clean and tidy, to ensure the safety of the circuit facilities, and to ensure that the experimental water is up to standard. Laboratory to ensure a sterile environment in the experimental process will not appear some other factors affecting the experimental results. At the same time, different laboratories should be taken between a certain anti-interference measures, so as to protect the scientific nature of the data within the laboratory, to prevent interference between laboratories, affecting the experimental results, resulting in experimental test results and the real results do not match the situation. Laboratory testing of fertilizers should also be in line with national standards, only then can reflect the true state of fertilizer. Laboratory personnel should also be in line with the times, to understand the latest experimental methods, to ensure that the experimental methods to meet national standards. This will ensure that the experimental results have a certain degree of scientific.

3. Soil fertilizer laboratory quality control effective measures

Improve the quality of testing personnel. Want to improve the quality of soil fertilizer experiments, we need to improve the quality of testing personnel, from time to time to test personnel training, to help them understand the professional knowledge, so that they and those with professional knowledge, with the skills of the personnel to communicate, to promote the improvement of their thinking ability, exercise their testing skills.

Construct management and quality assurance system.

The relevant management system and code of practice can be distributed to the staff, so that they can read the code of practice in time and check the code of practice when they encounter problems. At the same time, in order to improve the staff's conscientiousness in their work and ensure the staff's enthusiasm for their work, it is necessary to set up a supervisory and management mechanism to inspect the staff's working condition from time to time and know the staff's experimental records, check the test results and ensure that the staff's work is in good condition. The experimental records of the staff, check the test results, guarantee the scientific nature of the test results, and improve the testing quality of soil fertilizer laboratory.

Apply standard substances with certificates. The laboratory should be equipped with standard substances, so that after the completion of the test, the data of the test and the standard substances can be compared. The test substance should have a certificate of conformity, so as to better judge the accuracy of the test data, and to understand whether the testing process is scientific.

Implement laboratory proficiency testing activities. Laboratory capacity for laboratory testing, to ensure the stability of laboratory testing quality, to promote the improvement of laboratory testing capacity, to strengthen the monitoring of the laboratory work status, to ensure that the staff within the laboratory are always in a working condition, to improve their conscientiousness in the process of work, and to strengthen the supervision and management of staff to ensure that every step of the staff's testing in accordance with the relevant Operation specification, improve the laboratory testing level, promote the laboratory testing efficiency.

4. Effective methods of soil fertilizer laboratory quality control

Play the role of quality control charts and blank experiments. Quality control charts can understand the accuracy of the test results, in the actual testing process, by comparing and analyzing the testing information of each experiment, to understand the scope of the relevant data, through the experimental quality control charts can better understand whether the test results are reliable, if there is a fluctuation in the situation, but also can be compared to the experience of previous generations to find out the problems that occurred in the process of testing, and to take the solutions corresponding to it. The laboratory can use the information of the standard material as a basis to better compare the test results with the science. The establishment of blank experiments can reduce the influence of other factors on the whole experiment, to ensure the scientific nature of the test results. In the process of testing samples, it is necessary to set up a blank experiment, which can better enhance the stability of the experiment.

Retained samples for re-testing. In the laboratory, soil fertilizer testing is completed, want to better guarantee the accuracy of the results, it is necessary to retain the samples once again for testing. If the difference between the test results and the previous results is not so big, it proves that the laboratory testing level meets the requirements. The results are scientifically valid. If the difference between the values is large, then it proves that there are some mistakes in the previous testing process, which requires the relevant staff to find out the reasons for the mistakes, and timely self-correction.

The use of standard substances. With the help of standard substances can detect the operating status of laboratory instruments. Only to ensure the accuracy of the laboratory instrument detection results, to ensure that the sensitivity of the instrument meets the relevant requirements, in order to better protect the scientific nature of the experimental results. When problems are found in the instrument, the problem should be solved in the shortest possible time. After the completion of the test material data and standard material data for comparison, you can guarantee that the entire laboratory equipment are in an efficient state of operation, the standard material can also test the professional knowledge and skills of the inspectors to ensure that the inspectors meet the laboratory testing standards. Ensure that the inspectors in the work process in accordance with relevant regulations for operation. Improve the professional knowledge and skills of the inspectors to ensure the scientific nature of the test results, improve the quality of laboratory testing.

The use of reproducible testing methods. Laboratory in the detection process, the need to use the reproducibility of the test method, compared to the staff's detection methods and instrument performance. Each detector should be on the same sample for the experiment, to ensure the stability of the experimental data. In the experimental process, the need to use a unified instrument, to reduce the instrumentation factors affecting the scientific nature of the test results. The use of detection methods should be as different as possible, the staff in the same time in the same laboratory experiments, to take different testing programs for the same substance detection, the results of each person's experiments recorded in the book. The final comparison of the experimental results of each experimental personnel to ensure the accuracy of the test results. Through the comparison can also find out the optimal detection method, and then again in the detection process, you can use the previous detection method to improve the detection efficiency, to ensure that the results of the scientific nature of the test. At the same time through the test can understand the operation of laboratory equipment to ensure that the experimental equipment to meet the testing requirements, to ensure the accuracy of soil fertilizer test results.

Blindly repeat the sample

Within a specific time, the relevant inspectors can carry out blind repeat sampling activities, for a type of product testing. Before the test, the laboratory inspectors should not understand the relevant information of the sample, so that in the detection: the work process to get more scientific and accurate data, the data obtained with the previous test results for comparison, so as to test the laboratory testing methods. Laboratory testing methods of science.

3.6 Control precision and accuracy. Want to protect the precision of the test results, the need to use the parallel characteristics of the detection method, record the results of different testing programs, the use of which the difference in the value of the experimental data to understand whether the accuracy of the experimental data, only the difference in the value of the smaller to determine the accuracy of the experimental data, if the difference in the value of the larger, then the staff need to re-examine. Laboratory testing staff in the process of testing needs to use testing standards, understanding of precision, to ensure that the precision of instruments and equipment to meet the requirements. For a large number of samples for the process of testing, want to ensure the accuracy of the test results, need to use a random way to select all the samples 1/5 for testing. It should be noted that the test results are affected by the testing personnel and testing equipment. Sometimes the results of the experiment inevitably differ from the real value, but as long as the deviation of the value does not exceed the margin of error, it can be approximated that the value is accurate.

5. Summary

This article discusses the quality control methods in the process of soil fertilizer experiments to help you understand the main points of quality control in soil fertilizer laboratory, and if you want to carry out better quality control, you need to improve the quality of the testing personnel, build a management and quality assurance system, the use of certified standard substances, the laboratory's laboratory capacity test. To improve the quality control of soil fertilizer laboratory, it is necessary to fully utilize the control charts and need to fully utilize the role of control charts and blank experiments, from the new test to stay samples from new tests using standardized substances, applying reproducible testing methods, blindly conducting duplicate samples, and control the precision and accuracy of the instruments. Only in this way can improve the accuracy of soil fertilizer testing, improve the professional knowledge and skills of the relevant staff, and improve the quality of soil fertilizer testing in the field of land construction and soil management. knowledge and skills, and play the role of soil fertilizer experiment in land construction and government policy making. fertilizer experiment in land construction and government policy making.

Acknowledgments

This work was financially supported by Innovation Capability Support Program of Shaanxi(Program No.2021PT-053) fund.

References

- [1] Liu Xiaoli. Analysis of soil fertilizer laboratory quality control methods[J]. Agricultural family science and technology, 2018.
- [2]Wang Wei. Analysis of quality control methods in soil fertilizer testing laboratory[J]. China Agricultural Technology Promotion, 2013.
- [3] Tang Jialu. Analysis of quality control methods in soil fertilizer testing laboratory[J]. Digest Edition:Engineering Technology, 2015.