DEVELOPMENT AND INNOVATION OF DUS TEST TOOLS

Document prepared by an expert from China

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The annex to this document contains a copy of a presentation on “Development and innovation of DUS test tools”, to be made at the thirty-seventh session of the TWC.

[Annex follows]
Development and innovation of DUS test tools
(DUS测试工具研制与创新)

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If a worker wants to do a good job, he must first sharpen his tools.

——Confucius
main content

1. Introduction
2. Tools show
3. Existing problems
4. Plans and prospects
5. Summary

1. Introduction
At present, the testing method of DUS measuring traits is still relatively primitive and still needs to rely on manual recording, which is not only inefficient, but also has many errors. DUS tool market is still quite small, external capital is reluctant to enter, resulting in technical backwardness, so we have to develop the corresponding test tools.

The corn DUS test include 40 characteristics, the total data of one sample is 249 (26+3+11*20)

Proportion of data volume:
- Data volume ratio, VG, 10.4, 10%
- Data volume ratio, MG, 1.2, 1%
- Data volume ratio, MS, 88.4, 89%
Our objective

efficient + accurate + comfort = DUS test

2. Completed work
1. Standardized sowing mode

2. The tools for measure characteristics test

3. Data records of visual characteristics

4. Photo tools

Laser marking: legible and reusable
**Single-barrel portable seeder:**
It is suitable for planting in residential areas after improvement.

**Roller seeder:**
Suitable for protection row and small area sowing.
Technical features of spring sowing mode:
(1) laser marking: clear writing and repeated use
(2) matrix area code: precise positioning,
(3) improved seeder: unified sowing depth, simple and convenient replacement

2. The tools for corn measure characteristics

Objectives of improved measurement tools:
Save the manual process of counting, recording and data input, reduce the manual error and improve the efficiency.
Corn plant height measuring instrument

Measure the plant height and ear height at the same time

Corn tassel measuring system

Two-screen all-in-one computer

Bar code scanner
traits:
1. Use laser to measure the length and width of the corn ear
2. Keep the table clean
3. QuickSlice the corn ear
4. The corn thresher Prevent splashed and reduce noise
5. Modularization Design
The corn ear testing platform

The corn ear cutting platform

efficient
convenient
safe
Corn thresher 1.0

Version 2.0:
1. Humanization design
2. Attractive appearance
3. Mobile medical table combined with special camera monitor
4. The thresher is totally-enclosed
5. The power link interface of each module is plugged in, and the circuit is installed secretly
6. Data recording adopts industrial integrated machine
7. Scan code input number

Corn ear measuring system 2.0
Corn thresher 2.0

Quiet, Cleaner, More convenient, and more attractive appearance.

1.0 version 81 decibels, like on a busy road.

Original version 113 decibels, like an airplane propeller.

2.0 version 96 decibels, like rig sound.
The tool for grape
Provide by Zhengzhou sub-center

3. Data records of visual characteristics

Data acquisition unit

Portable
Dustproof and waterproof
store data in the cloud
4. Photo tools

**Corn tassel scissor:**
Converted from *cigar scissor*

**Tassel**
**Equilong**
**Adjustable**

**Photo background plate**
The evolution of background plate material

- **Stainless steel**: Too heavy, not convenient
- **acrylic**: Convenient, but easily deformed
- **Carbon fiber**: Convenient, deformation resistant
- **Titanium steel**: plan

Portable photography platform
innovate ≠ complex

The effectiveness of the roller sample rack

3. Existing problems
• Optimize software system

• Improve industrial design capacity

• There are contradictions between electronic data and paper data

• Tool development takes a lot of time, energy, material and financial resources

3. Plans and prospects
Intelligent visual character testing

Improve the tools for measuring traits

Internet of Things, Data cloud storage

Explore new materials for testing tools

Cooperate with related companies

Visual characteristics test

Visual characteristics

Image identification:
- Plant location

Machine learning:
- Identification character code

Build database
Corn leaf length and width measuring instrument
(Other technical applications)

Tensioning displacement sensor

Smaller
lighter

Field electric test vehicle

Drive remotely or follow automatically
Adjustable awning
Our purpose of tool development and innovation is nothing more than the following three points:

1. Improve **test quality** while maintaining test efficiency.
2. Improve **test efficiency** while ensuring test quality.
3. Under certain conditions of efficiency and quality, improve test **comfort level**.
I look forward to communicating and learning with you

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Thanks For Watching