

Technical Working Party on Automation and Computer Programs TWC/37/9**Thirty-Seventh Session
Hangzhou, China, October 14 to 16, 2019****Original:** English
Date: September 10, 2019

DEVELOPMENT AND INNOVATION OF DUS TEST TOOLS*Document prepared by an expert from China**Disclaimer: this document does not represent UPOV policies or guidance*

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)

HUO pengsheng

New plant variety testing center, Ministry of Agriculture, China
(Jinzhou sub-center)



子曰：工欲善其事
必先利其器

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**

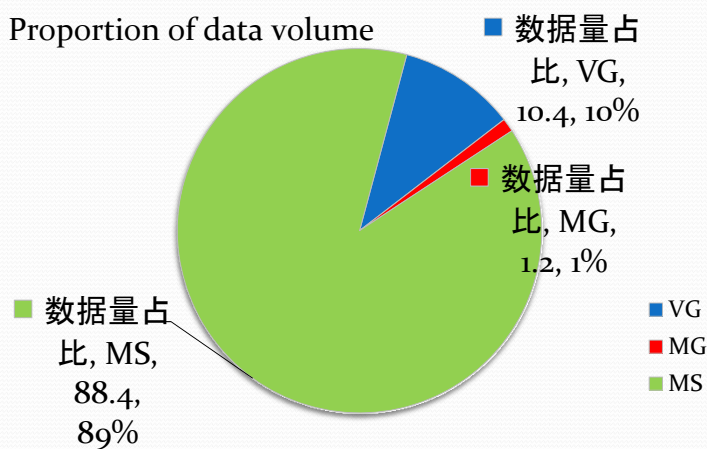
1. Introduction

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.



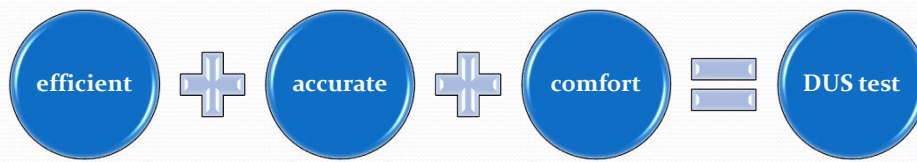
5

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



6

Our objective



2. Completed work

1. Standardized sowing mode

2. The tools for measure characteristics test

3. Data records of visual characteristics

4. Photo tools

1. Standardized sowing mode

**Laser marking:
legible and reusable**



Cell number

Serial number



Technical features of spring sowing mode:

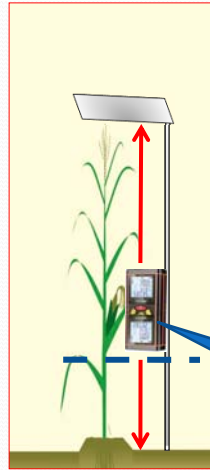
- (1) laser marking: clear writing and repeated use**
- (2) matrix area code: precise positioning,**
- (3) improved seeder: unified sowing depth, simple and convenient replacement**

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





Corn ear measuring system1.0



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



Corn thresher1.0



Corn ear measuring system2.0



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 thresher2.0



Quieter
Cleaner
More convenient
attractive
appearance

1.0 version

81 decibel
, like on a
busy road

Original version

113 decibel,
like aeroplane
propeller

2.0 version

96 decibel
, like rig
sound



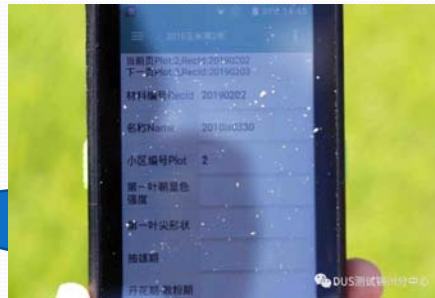
The tool for grape

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

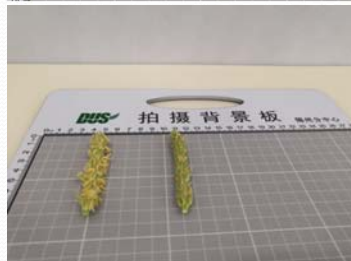
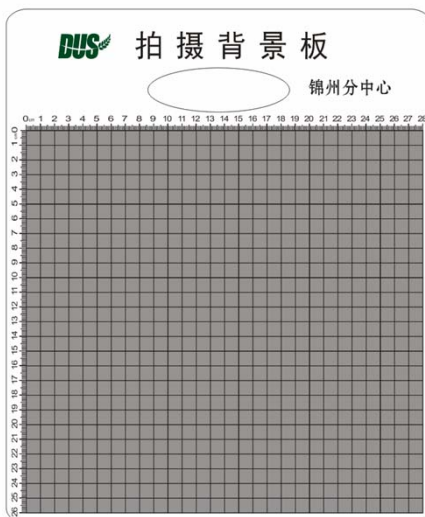


Corn tassel scissor:
Converted from **cigar scissor**

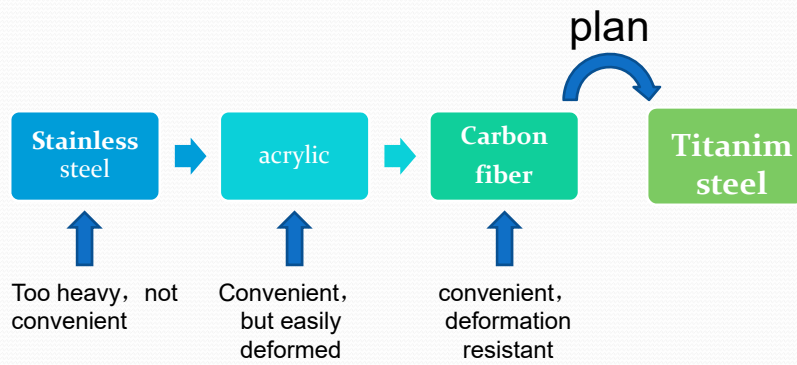
**Tassel
Equilong
Adjustable**



Photo background plate



The evolution of background plate material



Portable photography platform



innovate \neq complex

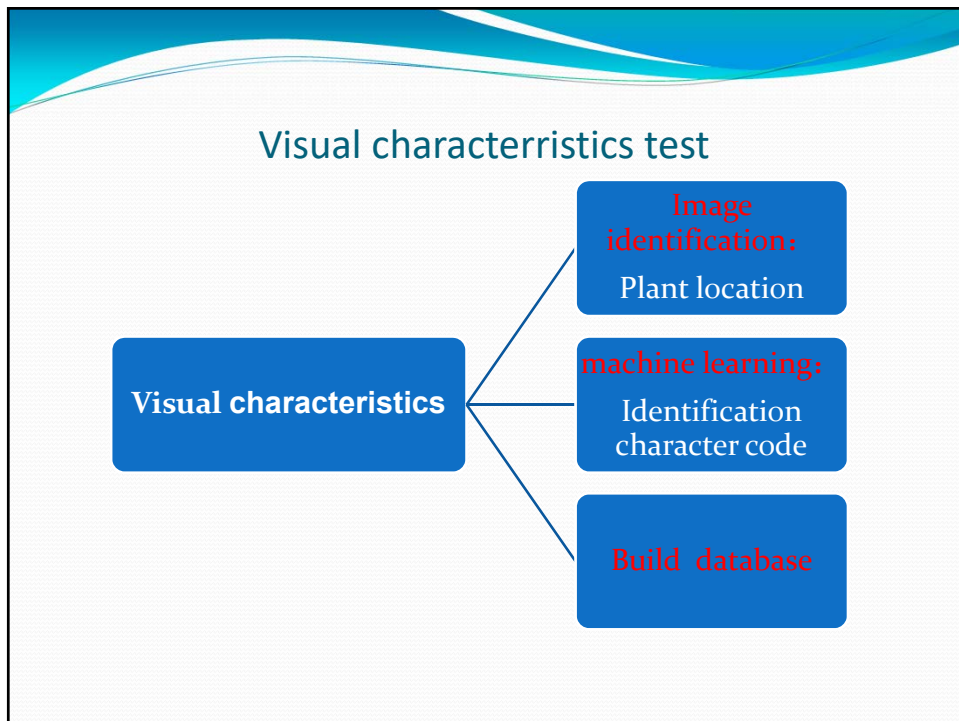
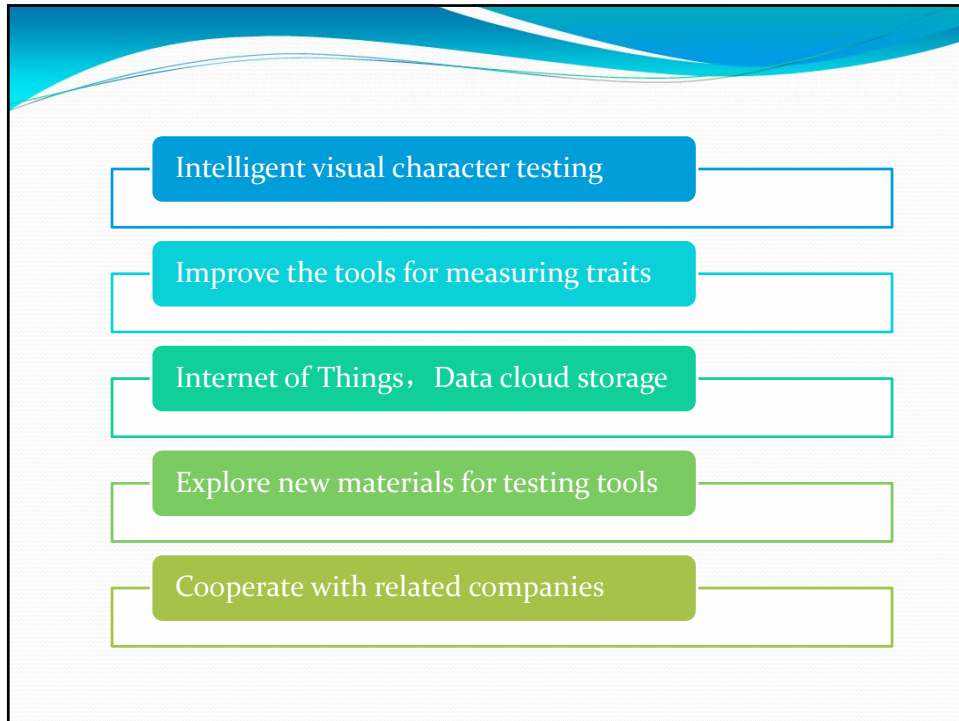
The effectiveness of the roller sample rack



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



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

Tensioning displacement sensor



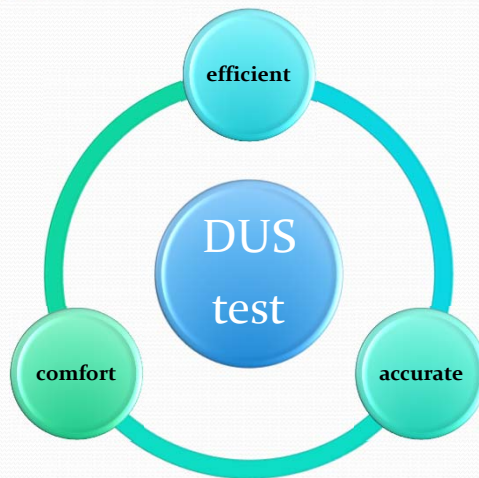
Field electric test vehicle

Drive remotely or
follow automatically

Adjustable awning



3. Summary



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**

e-mail address:

jzdus8@163.com

445990880@qq.com



**Thanks For
Watching**