Transformation of Observations and Measurements into Notes for Distinctness and for Variety Descriptions

Methods to Adjust for Fundamental Assessment Table in QN Characteristics

Hideki MAEDA
DUS Test Investigator,
DUS Test Division,
National Center for Seeds and Seedlings (NCSS), Japan

The Context

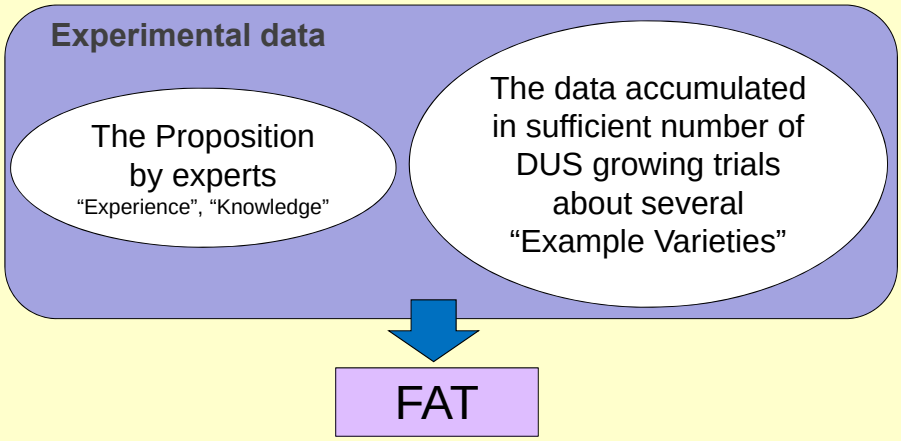
The relative assessment (assessment of note) is generally based on the data of “Example Varieties” in the DUS growing trial at that time.

We know some quantitative characteristics are influenced by the yearly variation.

We seek more effective method to reduce the yearly variation for concerned species which we have examined for many times.

The method with
Fundamental **A**ssessment **T**able (FAT)

What is FAT?



Basically, the FAT is available only for species that had examined in sufficient experience of growing trials about several "Example Varieties".

Composition of FAT

FAT

No.	Characteristics	d.p.	Note	1	2	3	4	5	6	7	8	9
10	Leaf : length	0			40	50	60	70	80	90	100	110
			Range	~	~	~	~	~	~	~	~	~
				39	49	59	69	79	89	99	109	
			Distance		10	10	10	10	10	10	10	
			Median		45	55	65	75	85	95	105	
			Example variety			EV-A		EV-B				
	mm		Remarks									

Note number: 1～9

e.g. Note 5

Range : 70～79 (mm)

Distance : 10 (mm)

Median : 75 (mm)

Example Variety: 'EV-B' ; Note 5

Type of Methods to Adjust for FAT

·The proportional method

To calculate the proportion of the measured data in the year (PD) to the mean of HD about “Example Varieties”.

The FAT multiplied by the proportion is the assessment table in the year.

·The sliding method (for the characteristic with fixed distance)

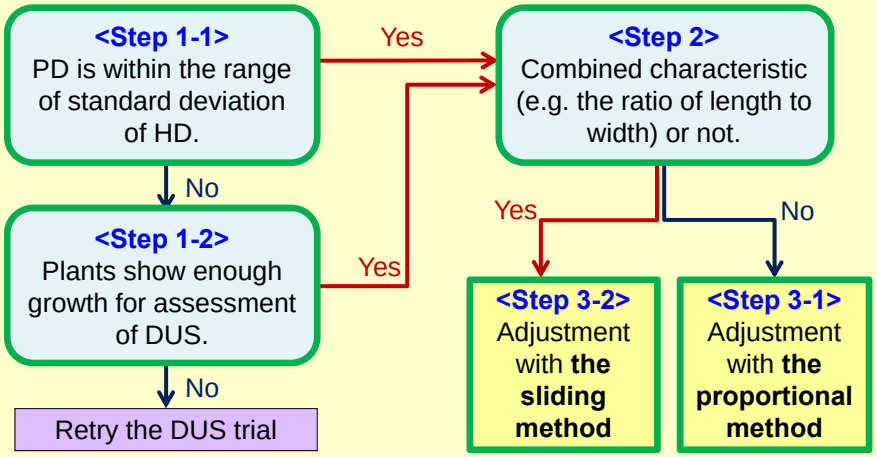
To calculate the subtraction of the mean of HD from the measured data in the year (PD) about “Example Varieties”.

The FAT added to the subtraction is the assessment table in this time.

※ PD: Present Data : The data of example varieties (EV) measured in this time

HD: Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Choosing of Methods to Adjust for FAT



※ PD: Present Data : The data of example varieties (EV) measured in this time

HD: Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

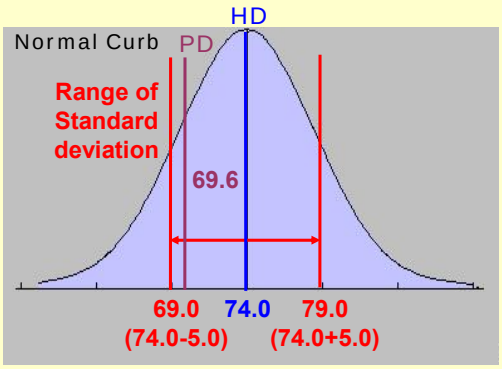
Step 1 : Is PD in the standard deviation of HD ?

7

Case study 1

e.g. Leaf length : PD is 69.6mm

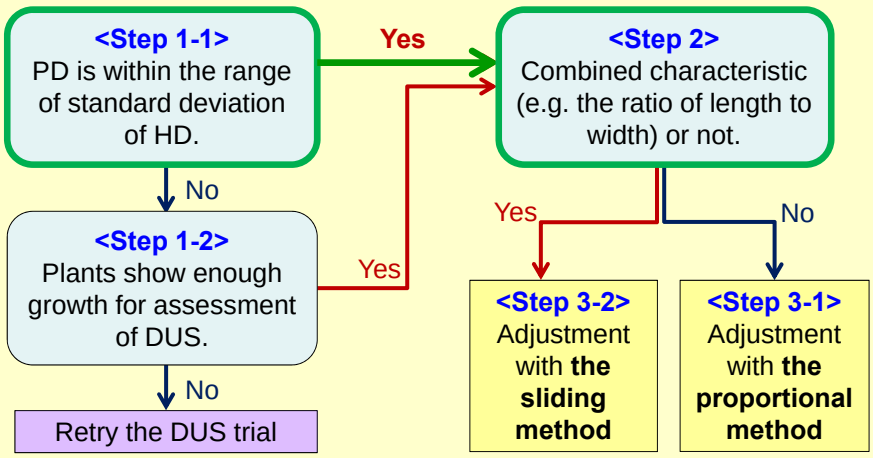
→ **Within the range of standard deviation of HD**



※ PD : Present Data, HD : Historical Data

Step 1 : Is PD in the standard deviation of HD ?

8



※ PD : Present Data : The data of example varieties (EV) measured in this time

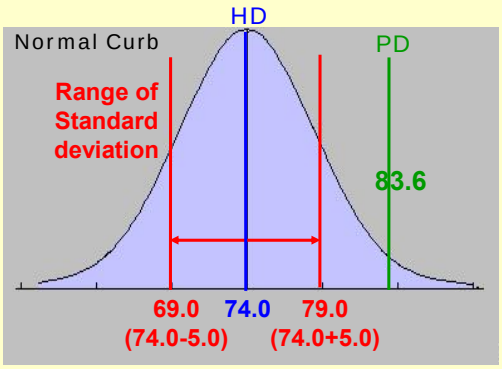
HD : Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Step 1 : Is PD in the standard deviation of HD ?

Case study 2

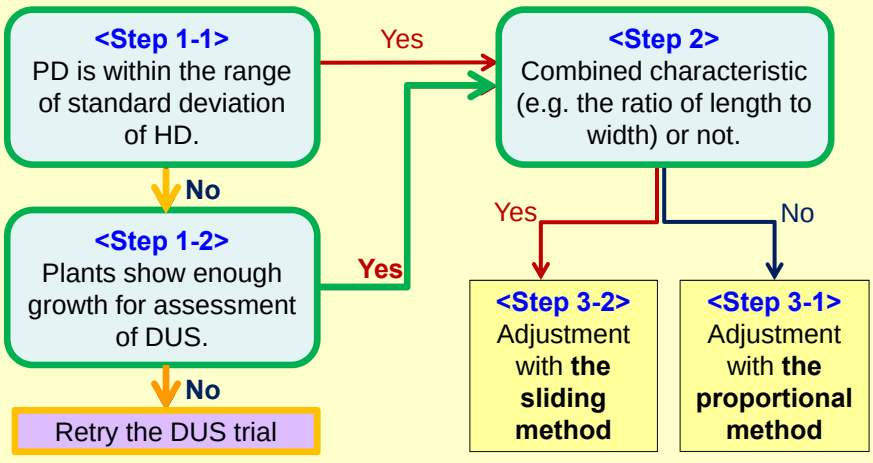
e.g. Leaf length : PD is 83.6mm

→ **Outside of the range of standard deviation of HD**



※ PD : Present Data, HD : Historical Data

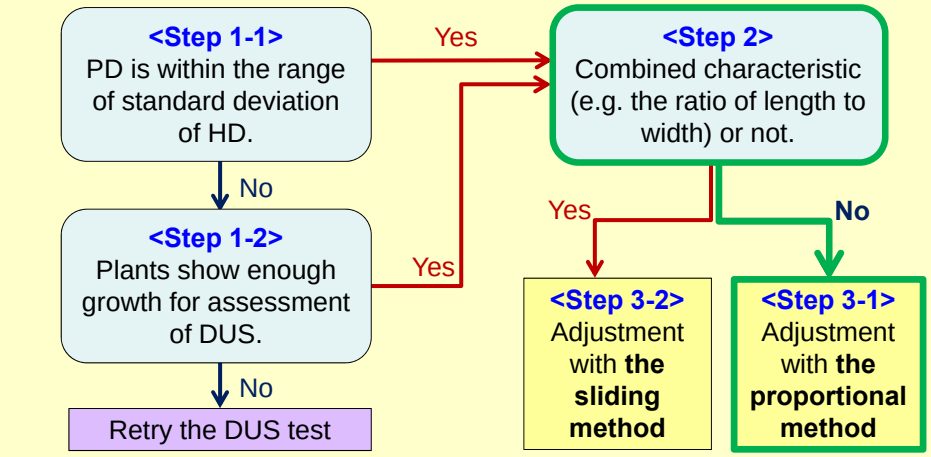
Step 1 : Is PD in the standard deviation of HD ?



※ PD : Present Data : The data of example varieties (EV) measured in this time

HD : Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Step2: whether characteristic is combined or not?



※ PD: Present Data : The data of example varieties (EV) measured in this time

HD: Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Adjustment with the proportional method

Characteristic: Leaf length

e.g. PD : 69.6 (mm)

HD : 74.0 (mm)

proportion

69.6mm／74.0mm＝0.94

※ PD: Present Data
HD: Historical Data

FAT

No.	Characteristics	d.p.	Note	1	2	3	4	5	6	7	8	9
10	Leaf : length	0			40	50	60	70	80	90	100	110
			Range	~	~	~	~	~	~	~	~	~
				39	49	59	69	79	89	99	109	
			Distance		10	10	10	10	10	10	10	
			Median		45	55	65	75	85	95	105	
			Example variety			EV-A		EV-B				
	mm		Remarks					69.6				

Before

Note	5
Range	70 ~ 79
Distance	10
Median	75
Example variety	EV-B
Remarks	69.6

×0.94 =65.8

×0.94 =74.3

After

Note	5
Range	65.8 ~ 74.3
Distance	9.5
Median	70.1
Example variety	EV-B
Remarks	69.6

Adjustment with the proportional method

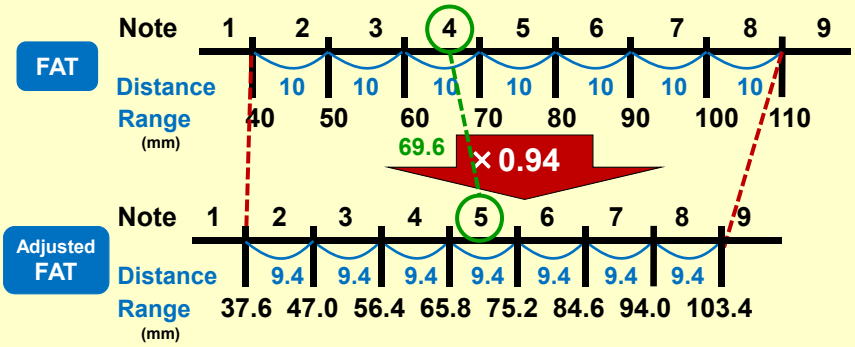
13

e.g. Characteristic: Leaf length

PD : 69.6 (mm)

HD : 74.0 (mm)

Proportion: 69.6mm / 74.0mm＝0.94

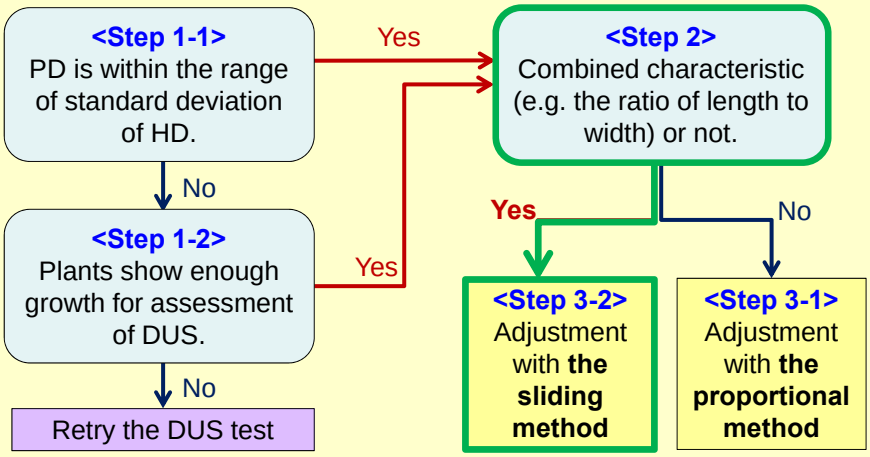


※ PD: Present Data : The data of example varieties (EV) measured in this time

HD: Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Step2: whether characteristic is combined or not?

14



※ PD: Present Data : The data of example varieties (EV) measured in this time

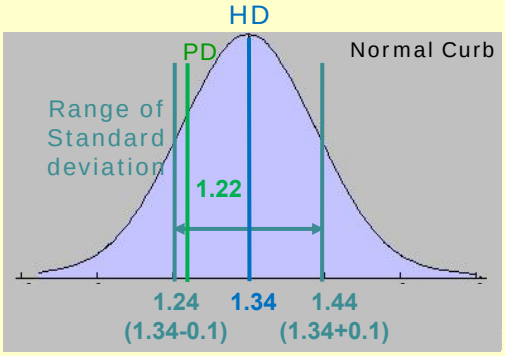
HD: Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Step 1 : Is PD in the standard deviation of HD ?

Case study 3

e.g. Ratio of leaf length / leaf width: PD is 1.22

→ **Within the range of standard deviation of HD**



※ PD: Present Data, HD:Historical Data

Adjustment with the sliding method

Characteristic: Ratio of leaf length / leaf width

※ PD: Present Data
HD:Historical Data

e.g. PD : 1.22

HD : 1.34 (Range: 1.24～1.44)

Subtraction

1.34－1.22＝0.12

FAT

No.	Characteristics	d.p.	Note	1	2	3	4	5	6	7	8	9
12	Leaf : ratio: length / width	2	Range		0.65 ~ 0.84	0.85 ~ 1.04	1.05 ~ 1.24	1.25 ~ 1.44	1.45 ~ 1.64	1.65 ~ 1.84	1.85 ~ 2.04	2.05 ~
			Distance		0.20	0.20	0.20	0.20	0.20	0.20	0.20	
			Median		0.75	0.95	1.15	1.35	1.55	1.75	1.95	
			Example variety					EV-B				
	ratio		PD					1.22				

Before

Note	5
Range	1.25 ~ 1.44
Distance	0.20
Median	1.35
Example variety	EV-B
PD	1.22

－0.12 = 1.13

－0.12 = 1.32

PD ≒ Median

After

Note	5
Range	1.13 ~ 1.32
Distance	0.20
Median	1.23
Example variety	EV-B
PD	1.22

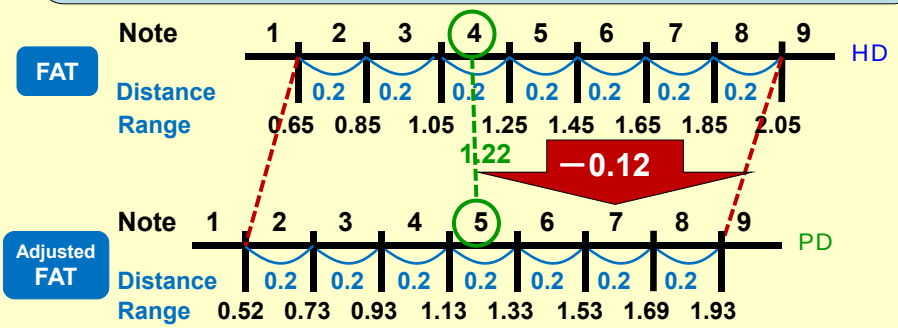
Adjustment with the sliding method

e.g. Characteristic: Ratio of leaf length / leaf width

PD: 1.22

HD: 1.34

→ Subtraction: 1.34 − 1.22 = 0.12



※ PD: Present Data : The data of example varieties (EV) measured in this time

HD: Historical Data: Mean of the data of EV measured in sufficient number of DUS growing trials

Methods to Adjust for FAT and Propagation Systems of Plants

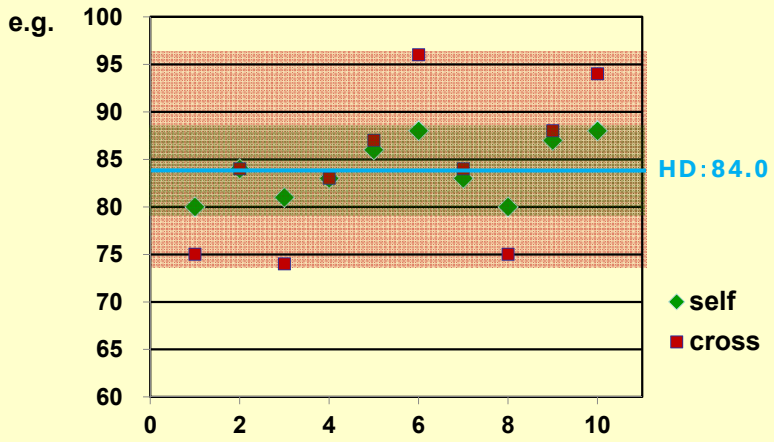
Difference between self-pollinated varieties and cross-pollinated varieties

e.g.

	Self EV	Cross EV
1st year	80	75
2nd year	84	84
3rd year	81	74
4th year	83	83
5th year	86	87
6th year	88	96
7th year	83	84
8th year	80	75
9th year	87	88
10th year	88	94
Historical Data (HD)	same 84.0	= 84.0
Standard Deviation	low 3.13	high < 7.69

Difference between self-pollinated varieties and cross-pollinated varieties

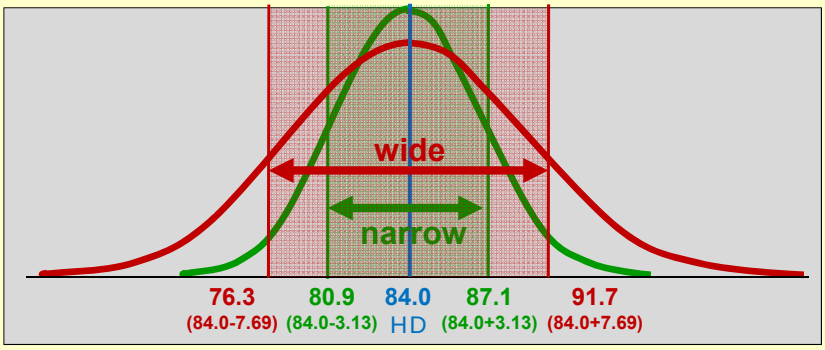
19



Difference between self-pollinated varieties and cross-pollinated varieties

20

	Self EV	Cross EV
Historical Data (HD)	84.0	84.0
Standard deviation	3.13	7.69
Range of Standard deviation	80.9～87.1 (mm)	76.3～91.7 (mm)



Coverage of FAT

The adjustable range changes according to the standard deviation of HD of “Example Varieties”.

Tendency :

- Self-pollinated varieties; narrower adjustable range
- Cross-pollinated varieties; wider adjustable range

The propagation systems of “Example Varieties” are automatically reflected in the adjustable range.

The methods to adjust for FAT can be applied to both self-pollinated varieties and cross-pollinated varieties.

Thank you very much for your attention !

http://www.ncss.go.jp/

by Hideki MAEDA