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CONSIDERATION ON THE USE OF SPECTROPHOTOMETER TO THE COLOR EVALUATION IN DUS TESTING

Document prepared by an expert from Japan

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The annex to this document contains a presentation “Consideration on the use of spectrophotometer to the color evaluation in DUS testing”, to be made by an expert Japan, at the fifty-eighth session of the TWO.

[Annex follows]

農研機構 NARO

Consideration on the use of spectrophotometer to the color evaluation in DUS testing.

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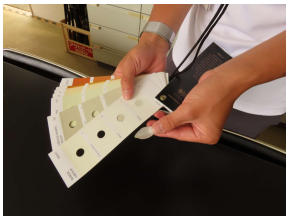
1. Current issues in color evaluation for DUS test



The evaluation of the reference NO. of RHSCC by visual observation is time-consuming.

機密・配付先限り

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2. About the spectrophotometer

SD-10 spectrophotometer produced by Seiko Epson Corporation.

※The detailed features of this device are as shown in the introduction video provided by Seiko Epson Corporation.

機密・配付先限り

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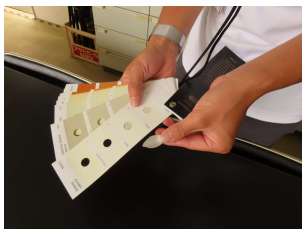
3. Objective

To examine whether the spectrophotometer can make DUS test efficient.



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4. Trial in 2024

● Method

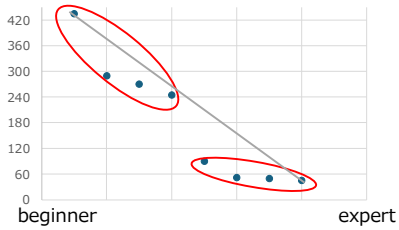
Comparison the time of evaluation between experts and beginners

Number of plant species	**3** plant species
Number of DUS tester	**8** DUS tester (with different levels of experience and proficiency)

● Result

Beginners need more time for visual observation than experts.
Time of processing by spectrometer is constant thorough all testers.

(ex.) Clematis



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4. Trial in 2024

Plant species	Characteristics	DUS tester	Working time	
			RHS colour chart	SD-10
Clematis	Sepal: color of upper side	DUS tester A	52sec	30sec Time from turn the power on to color measurement. 1sec to 2sec If you leave the power on, color measurement will be done at short times.
		DUS tester B	45sec	
		DUS tester C	50sec	
		DUS tester D	1min 30sec	
		DUS tester G (beginner)	4min 30sec	
	Sepal: color of lower side		7min 15sec	
	Sepal: color of upper side	DUS tester H (beginner)	6min 5sec	
	Sepal: color of lower side		7min 10sec	
Chrysanthemum multicaule	Petal: color of upper side	DUS tester E	1min 7sec	
		DUS tester F	1min 58sec	
	Petal: color of lower side	DUS tester E	1min 30sec	
		DUS tester F	37sec	
Evolvulus	Petal: color of upper side	DUS tester G (beginner)	4min 46sec	
Clematis	Sepal: color of upper side		4min 52sec	
	Sepal: color of lower side		10min 5sec	

機密・配付先限り

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5. Trial in 2026

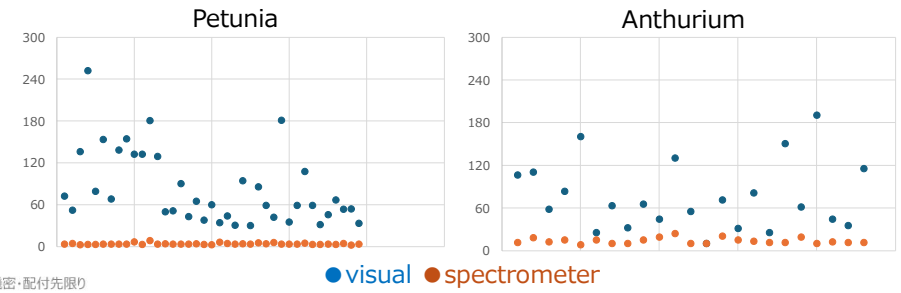
●Method

Comparison the time of evaluation between visual and spectrophotometer

Number of plant species	**3** plant species
Number of DUS tester	**2** DUS tester/sample
Number of measurements	**2** measurements/sample

●Result

Time of evaluation by visual is longer than spectrophotometer.



機密・配付先限り

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5. Trial in 2026

Plant species	Characteristics (number of variety)	Working time (ave sec)		Difference (sec)
		Human	SD-10	
Rose	Petal: main color on the inner side(17)	37.0	19.1	-17.9
	Petal: secondary color(2)	28.0	13.8	-14.3
	Petal: main color on the outer side(13)	24.8	12.0	-12.8
Anthurium	Spathe: main color of upper side(10)	97.0	14.0	-83.0
	Spathe: main color of lower side(10)	104.0	15.5	-88.5
Petunia	Flower: main color(7)	71.8	4.6	-67.2
	Flower: secondary color(4)	60.4	3.5	-56.8
	Young flower: main color(7)	70.6	3.5	-67.2
	Aged flower: main color(7)	71.9	3.4	-68.5
	Corolla tube: main color of inner side(7)	87.1	4.5	-82.5
	Corolla tube: main color of outer side(7)	61.1	3.5	-57.6
	Ave sec	64.9	8.9	-66.5

▲86.4%

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6. Summary

● **Efficiency**

2024	2026
・Visual evaluation time is different between experience. ・Processing time of spectrometer is constant in all testers.	・Time of visual evaluation is longer than and spectrometer-based evaluation.

Evaluation can be carried out efficiently for all testers.

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[End of Annex and of document]