

DUS Testing Procedure

Center for Seeds and Seedlings,
NARO (NCSS)

Nishi-Nihon Station

Hiroshi SHINKAWA

19 January 2021

- 1. Overview of examination procedures of plant new varieties**
- 2. Outline of test plan**
- 3. DUS growing test places in NCSS**
- 4. Making of actual test plan**
- 5. Making of actual work plan**

Overview of examination procedures of plant new varieties - 1



Application documents of candidate varieties

(For new variety registration)



PVP office (MAFF)

Division

DUS test methods

On-Site Inspection
25%



Growing Test
(in NCSS)
70%



Documentary Examination
5%



DUS test methods

On-Site Inspection
25%



Growing Test
(in NCSS)
70%



Documentary Examination
5%



New

Not new

Variety registration

Rejection

[Applicant will be granted the breeder's right of the new variety.]

General flow of DUS growing test

Test plan



Work plan



Cultivation



Assessment



Test report



Test plan is a simple list that summarized when, where and how to do DUS growing test.

Work plan is a document that is described concrete cultivation method for each plant species.

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Outline of test plan - 1



MAFF (PVP office)

Notification of candidate varieties list
in growing test



NCSS Headquarters

①Planning for growing test

Planning for MS Test in 2014

Creating year : 2014/01/01

No.	Application No.	Botanical Name	Name of candidate var.	Application status	Note
73	24896	Chrysanthemum L.	Bransky Lilac		
74	27700	Cyclamen L.	Silver crab red		
75	27701	Cyclamen L.	Silver crab red		
76	27702	Cyclamen L.	Silver crab red		
77	27703	Cyclamen L.	Silver crab red		
78	27704	Cyclamen L.	Silver crab red		
79	27705	Cyclamen L.	Silver crab red		
80	27706	Cyclamen L.	Silver crab red		
81	27707	Cyclamen L.	Silver crab red		
82	27708	Cyclamen L.	Silver crab red		
83	27709	Cyclamen L.	Silver crab red		
84	27710	Cyclamen L.	Silver crab red		

candidate varieties list

partial enlarged view

Application number

Botanical name

Candidate variety name

24896	Chrysanthemum	Bransky Lilac
27700	Cyclamen L.	Silver crab red
.	.	.
.	.	.
.	.	.

NCSS makes the test plan based on candidate varieties list.

Outline of test plan - 2

DUS growing test is planned so that the test is systematically conducted.

When making test plan, we have to take into account **some factors**.



Site suitability

Preparation of seedlings

Available Site

Work force



Facility

Budget



etc.

It is very efficient to make test plans prior to the conduct of DUS growing test.

Outline of test plan - 3

The important point is that the test plan has to be planned to sufficiently induce the characteristics of the candidate variety.

References

Application document

Test guideline

NCSS technical manual

Past report

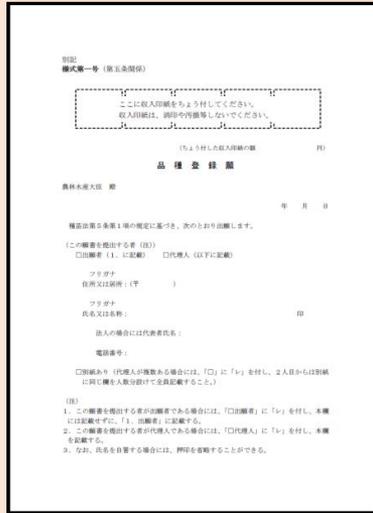
Information from experts

Literature



Standard cultivation methods are described in these references.

Outline of test plan - 4 : Details of the application document



Application Form

- Applicant's name
- Applicant's address
- Botanical name
- Variety name
- Breeder's name

etc.



Technical Questionnaire (TQ)

- Contact information
- Breeding method
- Propagation type
- **Characteristics data**

etc.

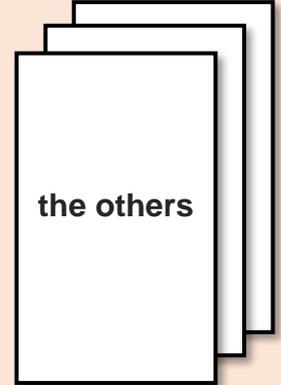


(e.g. Cyclamen)

Photographs

- Panoramic view
- Plant
- Flower
- Leaf

etc.



the others

It is important to check and arrange the information of candidate variety written in application document.

Outline of test plan - 5

: Decision on a DUS growing test method

when, where and how

Testing place

Test plot

Cultivation period

Cultivation type

Quantity of submission plant material

etc.

It is important that test place and cultivation period for each plant species should be fixed for sufficiently inducing the characteristics of plants.



- Accumulation of test data and experiences
- Improvement of the accuracy of the assessment
- Easy to refer to the past data
- Estimate the annual variation of growth amount of plants



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DUS growing test places in NCSS - 1



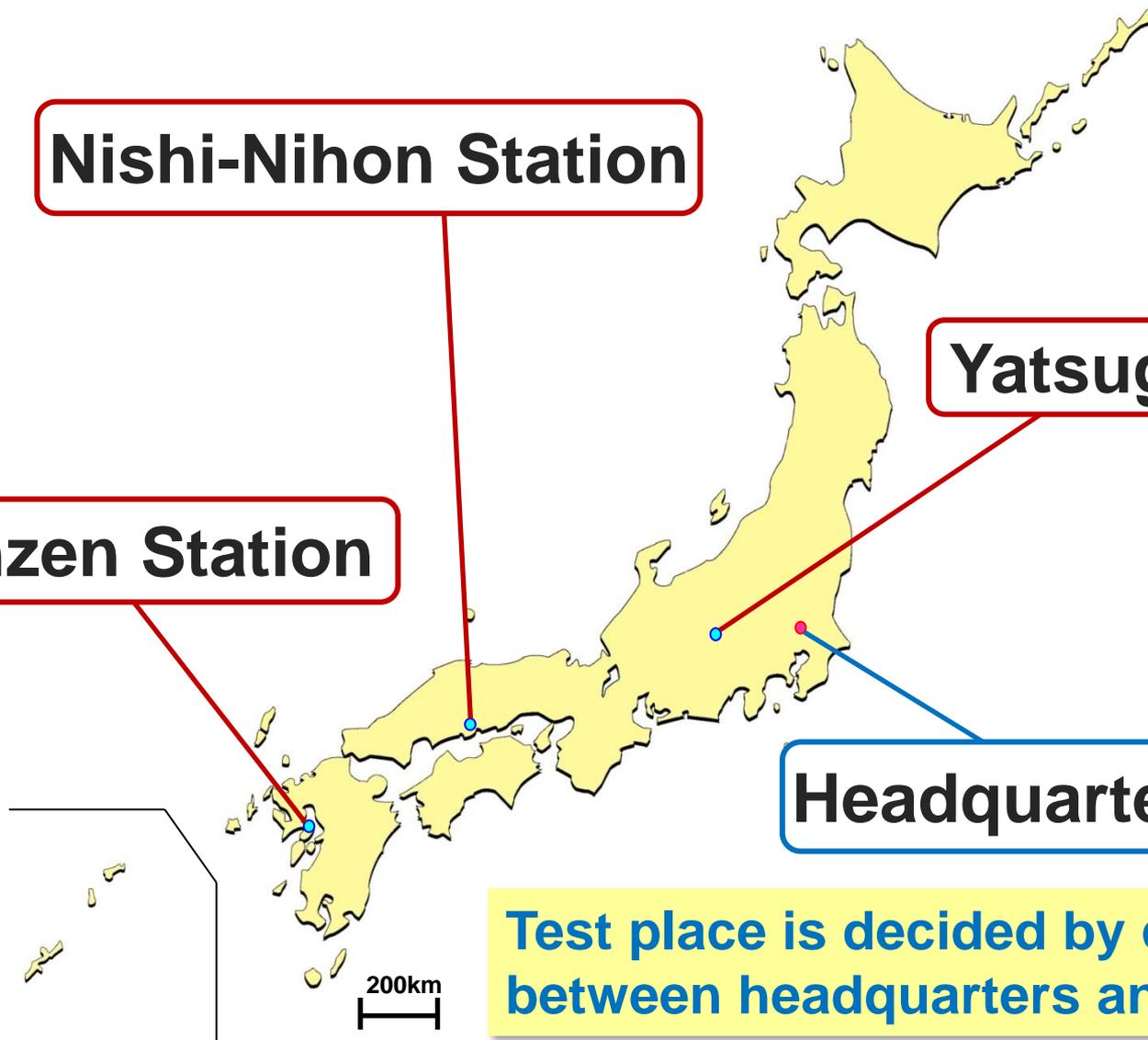
Nishi-Nihon Station

Yatsugatake Station

Unzen Station

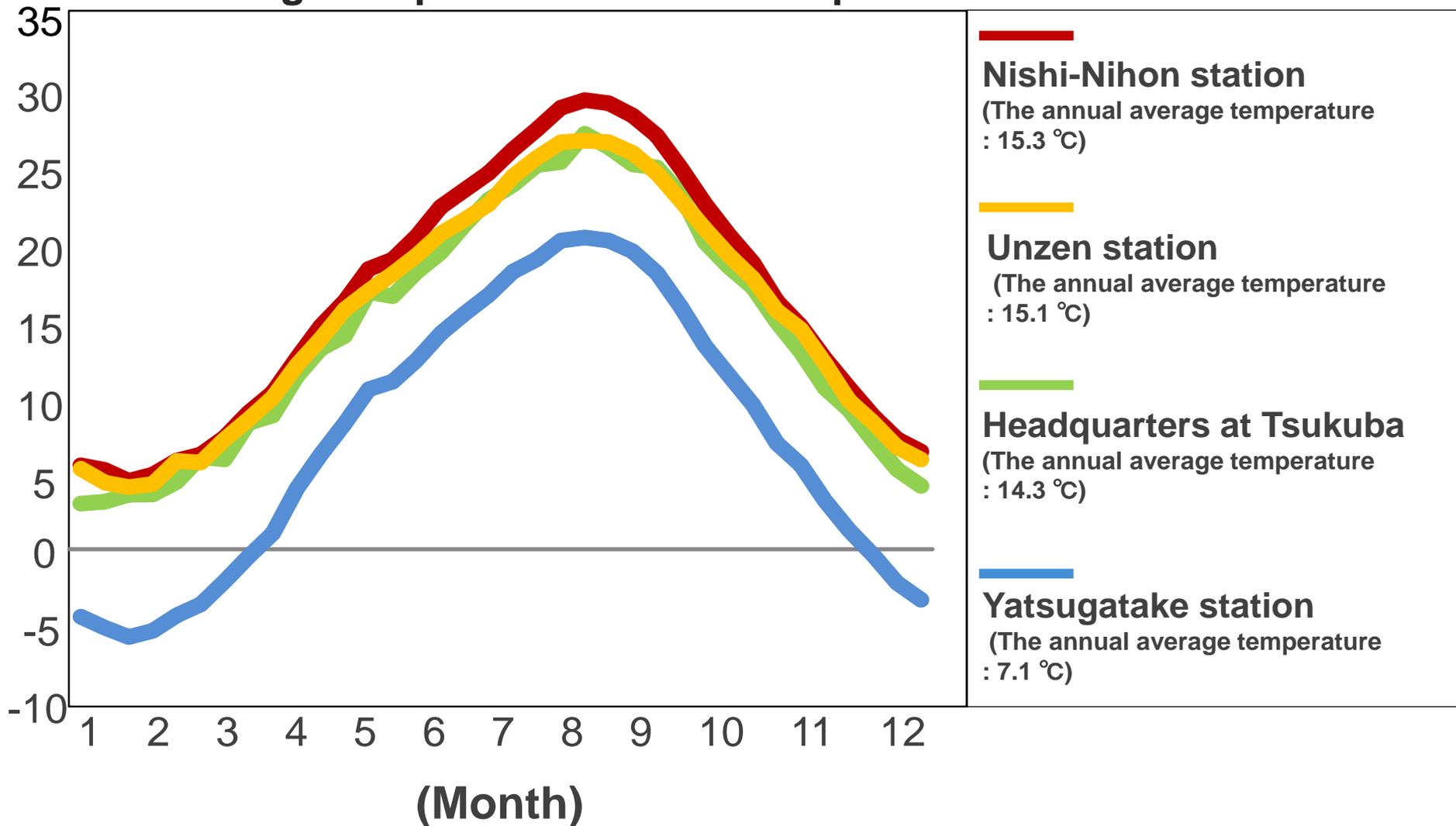
Headquarters at Tsukuba

Test place is decided by coordination between headquarters and other stations.



DUS growing test places in NCSS - 2

(°C) The average temperature in each test places



DUS growing test places in NCSS - 3

NCSS headquarters at Tsukuba

- Mild climate
- Plain
- External field (about 39a)
- 85 varieties in 2018 (28 plant species)

Plant species with a small number of applications

New ornamental Plant

etc.



(e.g. Asarina)

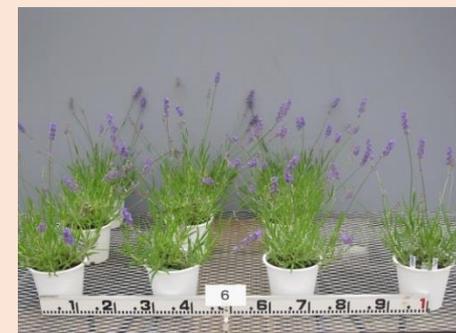
Yatsugatake station

- Cool climate
- High mountain
- 52 varieties in 2018 (12 plant species)

Limonium

Lavender

etc.



(e.g. Lavender)

DUS growing test places in NCSS - 4

Nishi-Nihon Station

- Warm climate
- Plain
- Wide area
(about 13.5ha)
- **445 varieties** in 2018
(34 plant species)

Chrysanthemum

Rose

Carnation

etc.



(e.g. Chrysanthemum)

Unzen Station

- Warm climate
- Slightly higher mountain
- **Wide difference in temperature
between day and night**
- 127 varieties in 2018
(29 plant species)

Tomato

Strawberry

etc.



(e.g. Tomato)

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Making of actual test plan - 1

A part of actual test plan

Botanical name	Name of candidate var.	Application No.	Testing Place	Material required		Closing date of materials submitting	Outline of DUS growing test		
				Type	Quantity		Cultivation period	Cultivation type	Test plot
Chrysanthemum	Mizuho	78901	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition
	Hayabusa	78902	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition
	Tsubasa	78922	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition

partial enlarged view

Botanical name	Name of candidate var.	Application No.	Testing place
Chrysanthemum	Mizuho	78901	Nishinohon station
	Hayabusa	78902	Nishinohon station
	Tsubasa	78922	Nishinohon station

Making of actual test plan - 2

A part of actual test plan

Botanical name	Name of candidate var.	Application No.	Testing place	Material required		Closing date of materials submitting	Outline of DUS growing test		
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partial enlarged view

Material required		Closing date of materials submitting
Type	Quantity	
Cutting	40	July 3 to 7



Cutting



Cell nursery plant



Pot (young) plant



Seed

It is necessary to specify submitting date and type of materials for equalizing growth stage of all varieties under same test.

Making of actual test plan - 3

A part of actual test plan

Botanical name	Name of candidate var.	Application No.	Testing place	Material required		Closing date of materials submitting	Outline of DUS growing test		
				Type	Quantity		Cultivation period	Cultivation type	Test plot
Chrysanthemum	Mizuho	78901	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition
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partial enlarged view

Outline of DUS growing test		
Cultivation period	Cultivation type	Test plot
June 2017 - December 2017	Soil cultivation In green house	20plants / plot No repetition



Soil cultivation
In green house



Pot cultivation
In green house



Outdoor cultivation

Making of actual test plan - 1

A part of actual test plan

Botanical name	Name of candidate var.	Application No.	Testing Place	Material required		Closing date of materials submitting	Outline of DUS growing test		
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partial enlarged view

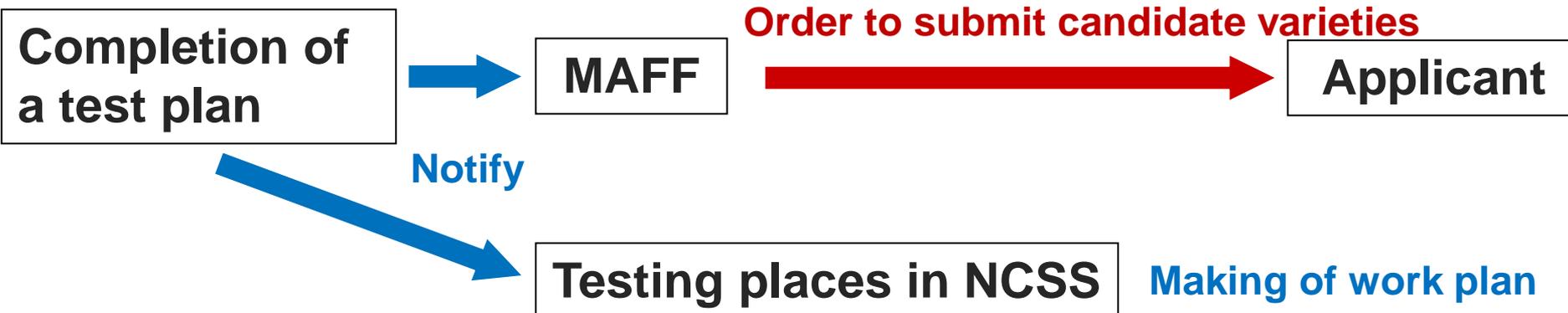
Botanical name	Name of candidate var.	Application No.	Similar variety
Chrysanthemum	Mizuho	78901	Inaho
			Suzume
			Huna

Making of actual test plan - 4

A part of actual test plan

Botanical name	Name of candidate var.	Application No.	Testing place	Material required		Closing date of materials submitting	Outline of DUS growing test		
				Type	Quantity		Cultivation period	Cultivation type	Test plot
Chrysanthemum	Mizuho	78901	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition
	Hayabusa	78902	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition
	Tsubasa	78922	Nishinohon station	Cutting	40	July 3 to 7	June 2017 - December 2017	Soil cultivation In green house	20plants /plot No repetition

It is very important to make a test plan so that we can conduct DUS growing test efficiently.

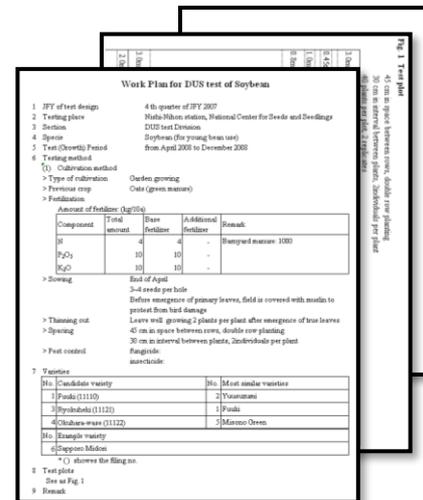


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Making of actual work plan - 1

What's the work plan?

The work plan is a plan document that is described in detail **who, when, where and how** should be conducted the DUS growing test.



Work Plan for DUS test of Soybean

1. JFY of test design: 4th quarter of JFY 2007
2. Testing place: Nishi-Hokoku Station, National Center for Soybean and Cowpea
3. Section: DUS test Division
4. System: Soybean (for young bean use)
5. Test (Cultivar) Period: from April 2007 to December 2007
6. Testing method:
 - (1) Cultivation method: Order sowing
 - (2) Type of cultivation: Out (green manure)
 - (3) Previous crop: Soybean
7. Fertilization:

Component	Total amount	Base fertilizer	Additional fertilizer	Remark
N	4	4	-	Strawed manure 1000
P ₂ O ₅	10	10	-	
K ₂ O	10	10	-	
8. Amount of seedling (kg/10a):
 - > Sowing: End of April, 3-4 seeds per hole. Before emergence of primary leaves, field is covered with mulch to protect from hot damage. Leave with growing 2 plants per plant after emergence of true leaves 45 cm in space between rows, double row planting 30 cm in interval between plants, 2000 plants per plot. Fungicide, insecticide.
 - > Thinning out: Leave with growing 2 plants per plant after emergence of true leaves 45 cm in space between rows, double row planting 30 cm in interval between plants, 2000 plants per plot. Fungicide, insecticide.
 - > Pest control: Fungicide, insecticide.
9. Varieties:

No.	Candidate variety	No.	Most similar varieties
1	Panda (1112)	2	Yamamoto
3	Hyakuhoku (1122)	1	Fuda
4	Chikara-wan (1122)	2	Maroon Oreo
10. Sample variety: Soybean-Midori
11. Test plate: Size as Fig. 1
12. Remark:

work plan

Cultivation method

- Sowing
- Fertilization
- Pest control

etc.

Varieties of DUS test

Trial layout



Cost



etc.

Why is it necessary to make a work plan?

Objectives

I . Confirmation of the practical method of the test

- recognition of the contents
- advance preparation

II . Sharing and accumulation of information.

- consistent and repeatable

(e.g. Panoramic view of hot pepper)



in 2016



Changed of the tester



Performing stable test



in 2017

Making of actual work plan - 3

Work plan for growing test of hot pepper

- | | |
|----------------------------|--|
| 1. Testing Place | Nishi-Nihon Station |
| 2. Name of tester | H. Shinkawa |
| 3. Botanical name of taxon | <i>Dianthus caryophyllus L.</i> |
| 4. Test (Growth) Period | From June in 2018 to June in 2019 |
| 5. Cultivation method | |
| (1) Type of cultivation | Soil cultivation |
| (2) Planting | In green house |
| (4) Spacing | Middle of June |
| (5) Number of plants | Quintuple row planting.
20cm in interval between plants.
15plants / plot, 2 repetition |



Making of actual work plan - 4

(6) Fertilization

Amount of fertilizer (kg/10a)

Component	Through a growth period	Amount (kg/10a)
N	Nitrate-Nitrogen around 10 mg/100g	10000
P ₂ O ₅	pH around 6.5	3800
K ₂ O	EC <0.8 mS/cm (Planting time <0.6 mS/cm)	3400
		7

(7)

• Insecticide: emamectin benzonate, etc.

(8) Pinching/Trimming - End of July/4 blanch

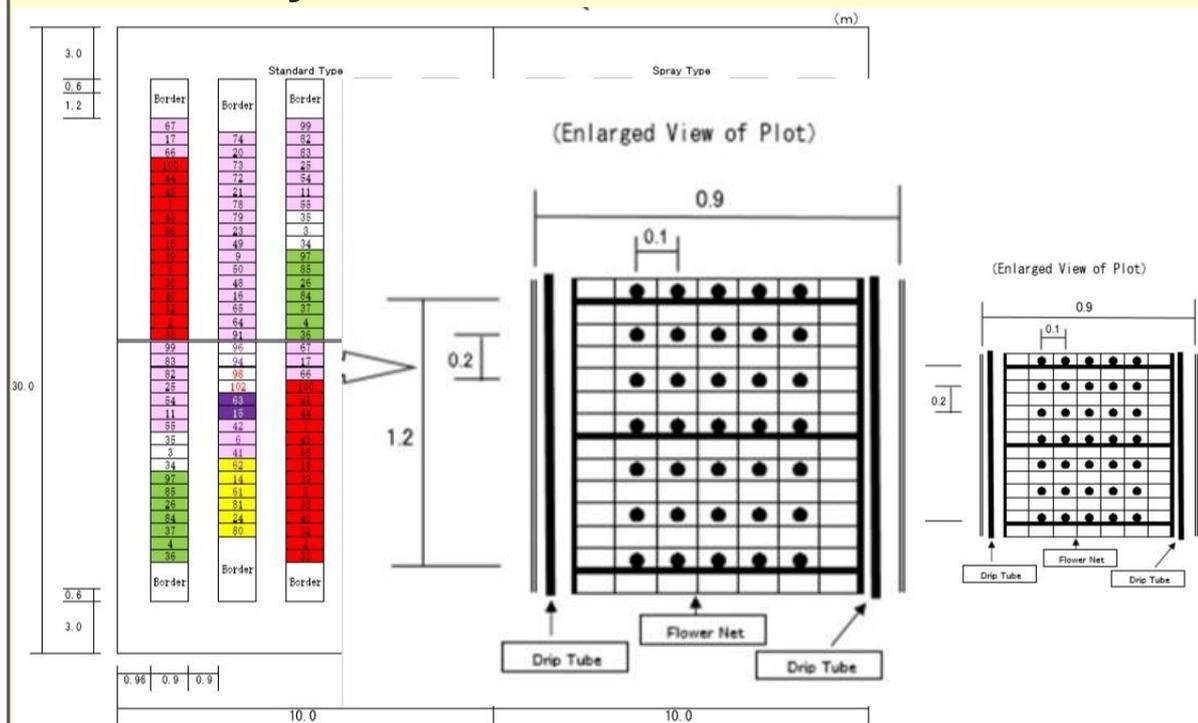


6. Varieties list

No.	Candidate variety	No.	Similar varieties	No.	Example varieties
1	VIL14A64	38	アンブローズ	126	MARTINA
.	.	39	LITHAL	127	Westcrystal
.	.	.	.		

Making of actual work plan - 5

7. Trial layout



8. Cultivation schedule

9. Cost

10. Remark

The work plan is checked by various staff in the headquarters.

High quality

Thank you for your attention.



NCSS Nishi-nihon Station