

*Pedigree*  
of  
*Bivoltine [V<sub>2</sub>] Silkworm Breeds*  
(*Bombyx mori* L.) developed at  
**CSRTI, MYSORE**



**Dr. B.B. BINDROO**  
**Dr. A.NASEEMA BEGUM**  
**Dr. N.MAL REDDY**  
**Dr. S. M. MOORTHY**



**SILKWORM BREEDING LABORATORY**  
Central Sericultural Research & Training Institute,  
[An ISO 9001 : 2008 Certified]  
[Central Silk Board – Min. of Textiles – Govt. of India]  
Manandavadi Road, Srirampura, Mysore – 570 008  
April, 2014

*Pedigree*  
of  
*Bivoltine [V<sub>2</sub>] Silkworm Breeds*  
*(Bombyx mori L.) developed at*  
*CSRTI, MYSORE*

*Dr. B.B. BINDROO*  
*Dr. A.NASEEMA BEGUM*  
*Dr. N.MAL REDDY*  
*Dr. S. M. MOORTHY*



**SILKWORM BREEDING LABORATORY**  
**Central Sericultural Research & Training Institute,**  
**[An ISO 9001 : 8000 Certified]**  
**[Central Silk Board – Min. of Textiles – Govt. of India]**  
**Manandavadi Road, Srirampura, Mysore – 570 008**

Month & Year of Publishing: April 2014

Language: English

© All rights reserved

No part of this document or parts thereof may be reproduced, stored in retrieved system or transmitted in any form, any language or by any means, electronic, mechanical photocopying recording or otherwise, with our prior written permission of the publisher.

Authors:

Dr. B.B. BINDROO

Dr. A.NASEEMA BEGUM

Dr. N.MAL REDDY

Dr. S. M. MOORTHY

Cover design and Layout:

Mr.V.Ganesan, DD (Computer)

Published by:

The Director

Central Sericultural Research & Training Institute,

Central Silk Board - Min. of Textiles - Govt. of India

## **Preface**

Among the several components of sericulture, silkworm breeds/hybrids assume special importance in improving productivity and the quality of the silk. Over the last fifty years, many silkworm breeds / hybrids were developed by breeders of different sericulture research institutes of India and authorized for commercial exploitation. The improvement of silkworm breeds/ hybrids has played a vital role in boosting the silk production in India.

A pedigree is an important part of any breeding programme. It is the documentation of a pure silkworm breed and it shows the descendants of the silkworm breed over generations. Pedigree is also a history which gives the breeder a way to look back and know what combinations worked and which didn't. It serves as an official record to add to the breeding records, which are required to be preserved. It also serves as a research tool. Breeders can also look back on a pedigree and see silkworm breeds in common from one pedigree to another, as well as trends. A breeder will make notes on a research pedigree showing where genetic issues have shown up in the past breeding process so that those bloodlines can be avoided for initiating any new breeding strategy. The pedigree information is priceless to a breeder who is aiming towards continual improvement.

This document comprises information on pedigree and breeding schemes followed for developing of some of the productive bivoltine silkworm breeds developed at Central Sericultural Research and Training Institute, Central silk Board, Mysore. Of these, CSR2, CSR4, CSR6, CSR16, CSR17, CSR26 and CSR27 are most popular which are being commercially exploited extensively in field.

The authors thankfully acknowledge the immense contributions all the silkworm breeders who were associated with the development of silkworm breeds mentioned in this book. The authors thank Dr. Satish Verma, Scientist-E and Dr.S.K Aswath, Scientist-D for their logistic help in bringing out the document. The authors are grateful to Central Silk Board, Ministry of Textiles, Govt. of India for the support and encouragement.

*April, 28, 2014*

*Dr. B.B. BINDROO  
Dr. A.NASEEMA BEGUM  
Dr. N.MAL REDDY  
Dr. S. M. MOORTHY*

# *INDEX*

<b>S.No.</b>	<b>Name of the strain/Breed</b>	<b>Page</b>
1	CSR2	1
2	CSR3	3
3	CSR4	5
4	CSR5	7
5	CSR6	9
6	CSR12	11
7	CSR16	13
8	CSR17	15
9	CSR18	17
10	CSR19	19
11	CSR26	21
12	CSR27	23
13	CSR46	25
14	CSR47	27
15	CSR48	29
16	CSR50	31
17	CSR51	33
18	CSR52	35
19	CSR53	37
20	CSR2 (SL)	39
21	CSR8 (SL)	41
22	GEN2	43
23	GEN3	45
Name of Breeder and experts contributed towards development of silkworm breeds		47

## 1. CSR2

### Parentage:

- Shunrei x Shogetsu

### Characteristics:

- Developed during 90s.
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with fine to medium grains
- Fiber quality: 2A ~ 3A grade
- It is most popular bivoltine breed in India and being utilized as parent for popular bivoltine hybrid, CSR2 x CSR4 and Multivoltine x Bivoltine hybrid, PM x CSR2

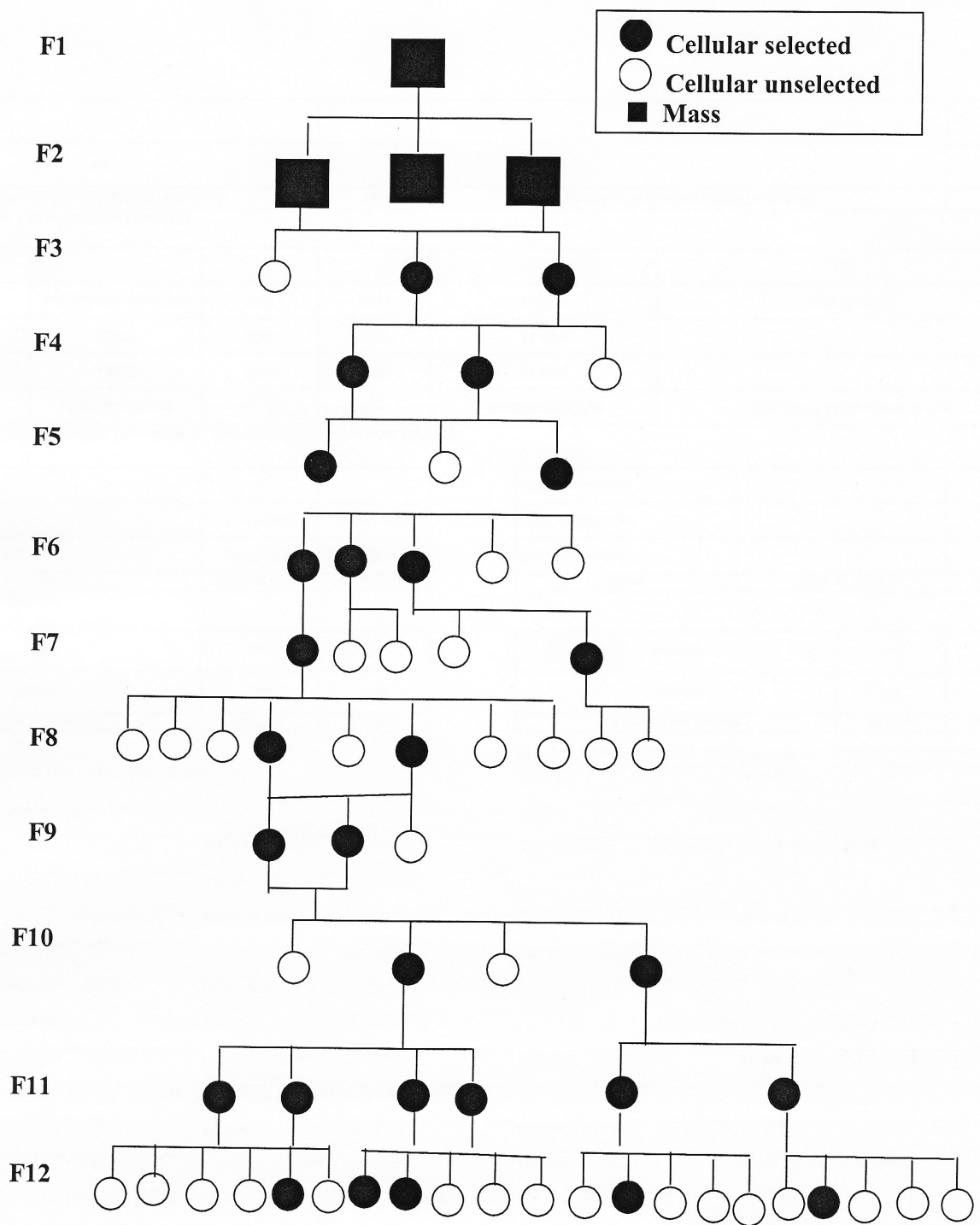
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 545   |
| ➤ Larval Duration (D:H) | 22:12 |
| ➤ Survival (%)          | 94.5  |
| ➤ Cocoon weight (g)     | 1.825 |
| ➤ Shell weight (g)      | 0.434 |
| ➤ Shell %               | 23.8  |
| ➤ Filament length (m)   | 1050  |
| ➤ Raw silk (%)          | 18.5  |
| ➤ Denier (d)            | 2.82  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



**Breeding Plan:**



## 2. CSR3

### Parentage:

- (BN18 x BC25) x CC1

### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Marked and plain larvae (sex - limited for larval makings) with reddish tinge colour (Female - marked , male - plain)
- Bright white oval shaped cocoons with medium grains
- Fibre quality: 2A ~ 3A grade

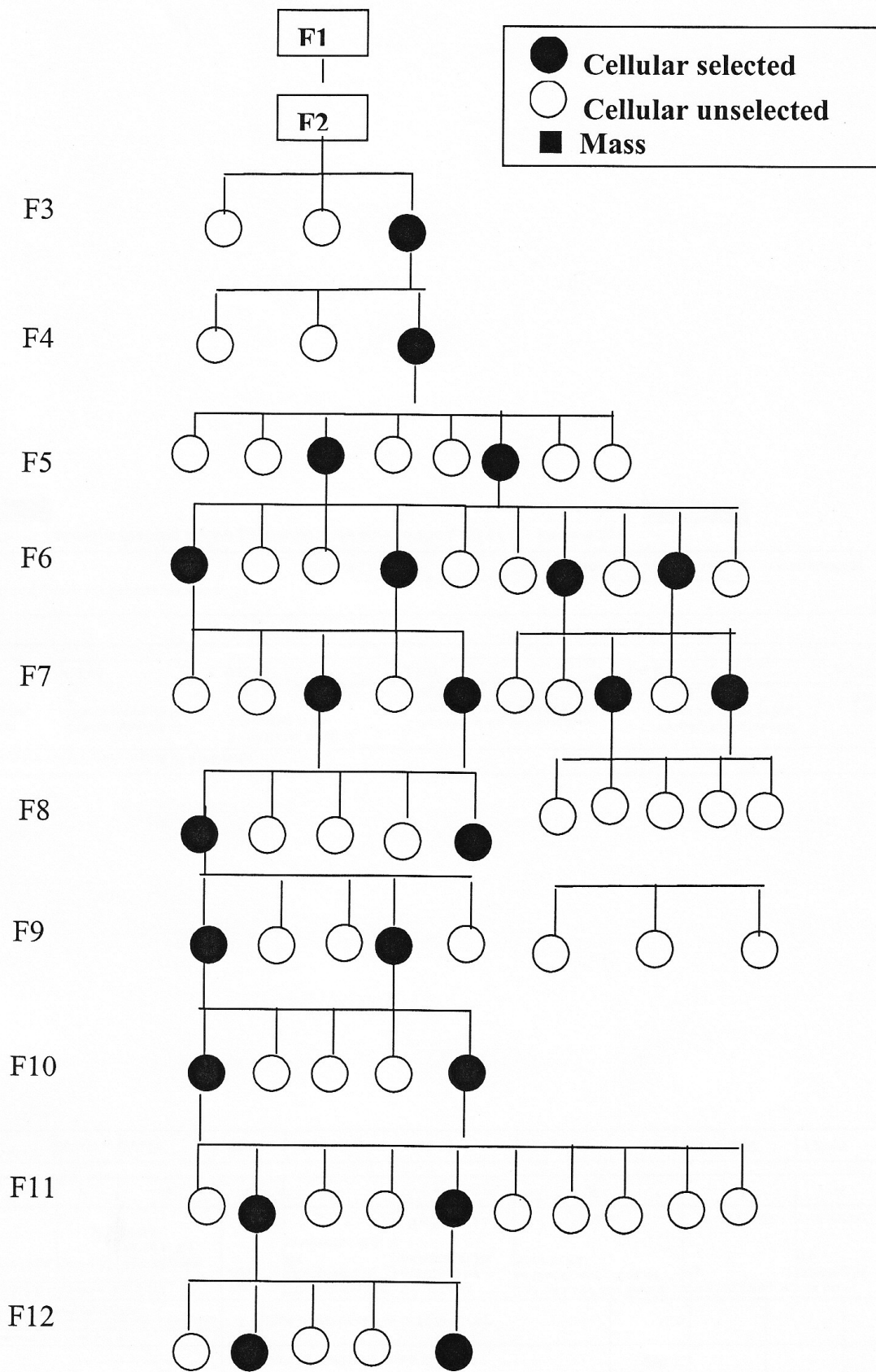
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 521   |
| ➤ Larval Duration (D:H) | 23:12 |
| ➤ Survival (%)          | 92.5  |
| ➤ Cocoon weight (g)     | 1.725 |
| ➤ Shell weight (g)      | 0.412 |
| ➤ Shell %               | 23.9  |
| ➤ Filament length (m)   | 18.2  |
| ➤ Raw silk (%)          | 1020  |
| ➤ Denier (d)            | 2.92  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



### 3. CSR4

#### Parentage:

- ( BN18xBCS25) x NB4D2

#### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality : 2A ~ 3A grade

#### Rearing and reeling traits:

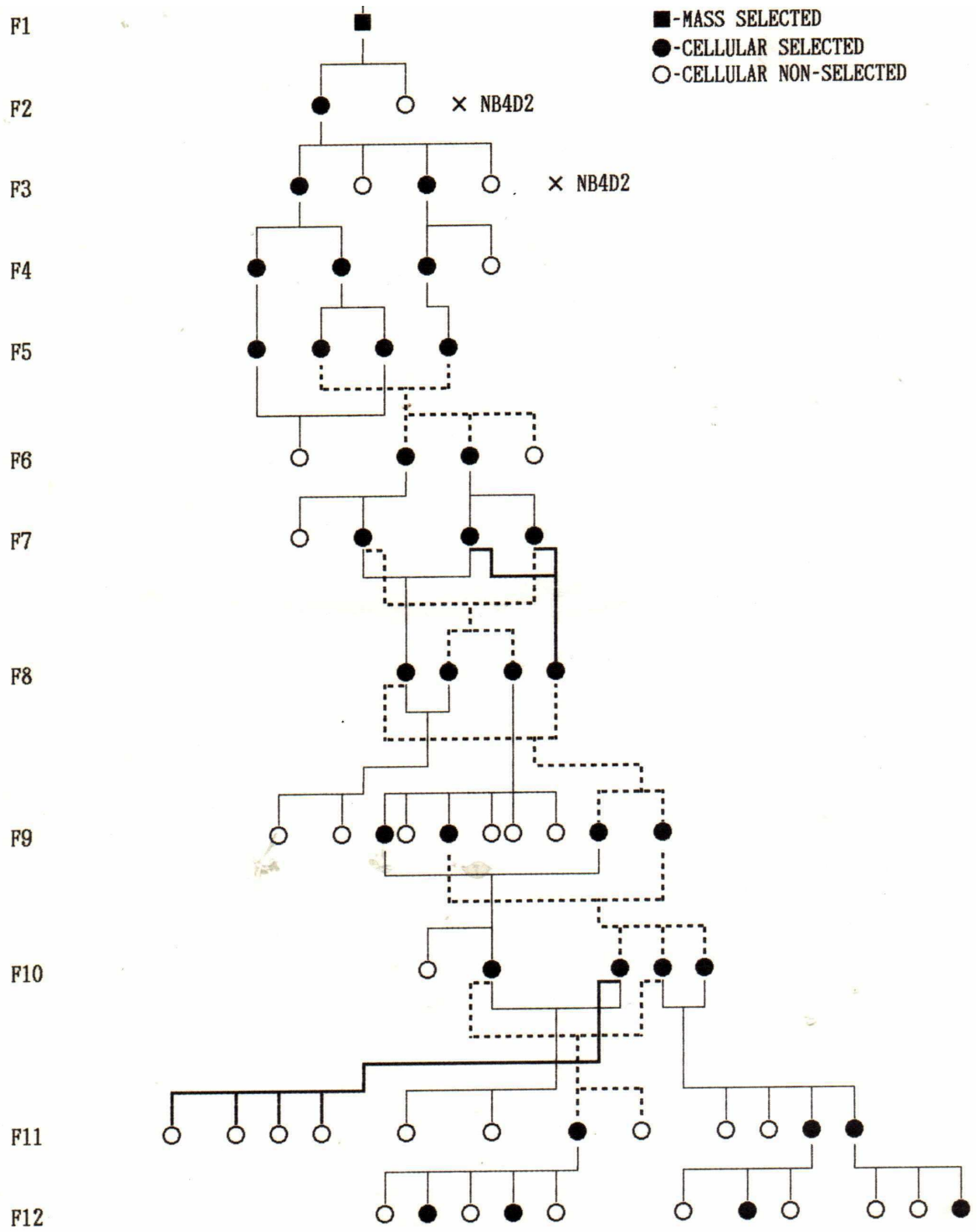
- |                         |       |
|-------------------------|-------|
| ➤ Egg/dfI               | 530   |
| ➤ Larval Duration (D:H) | 23:00 |
| ➤ Survival (%)          | 95.0  |
| ➤ Cocoon weight (g)     | 1.750 |
| ➤ Shell weight (g)      | 0.392 |
| ➤ Shell %               | 22.4  |
| ➤ Filament length (m)   | 975   |
| ➤ Raw silk (%)          | 17.2  |
| ➤ Denier (d)            | 2.88  |
| ➤ Neatness (p)          | 94    |

#### Larvae and Cocoons:



CSR4 is being utilized as parent for popular hybrid, CSR2 x CSR4.

## Breeding Plan:



## 4. CSR5

### Parentage:

- Shunrei x Shogetsu

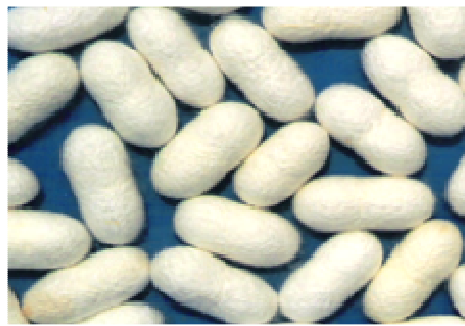
### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with creamish white body colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality :2A ~ 3A grade

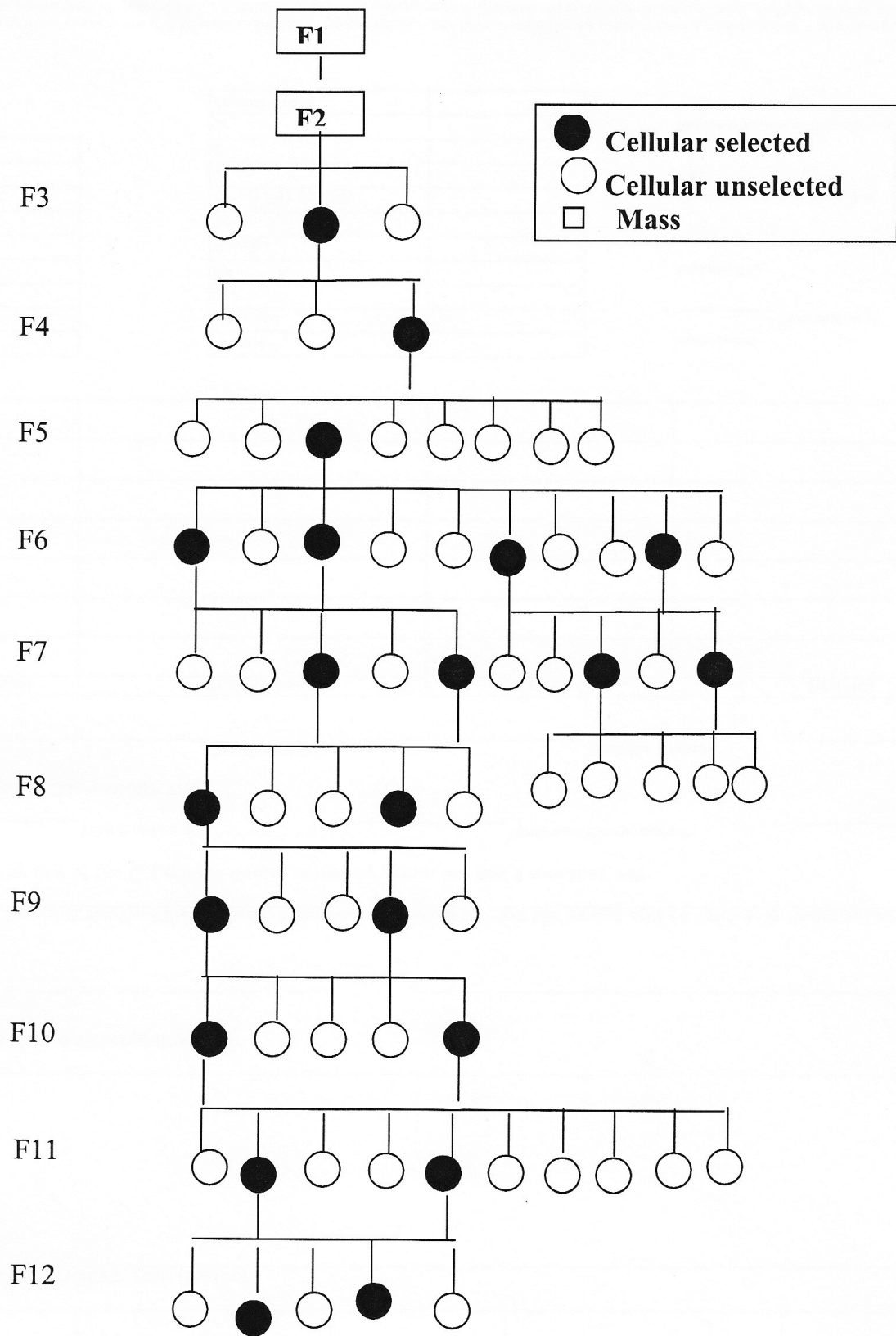
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 529   |
| ➤ Larval Duration (D:H) | 23:12 |
| ➤ Survival (%)          | 93.3  |
| ➤ Cocoon weight (g)     | 1.725 |
| ➤ Shell weight (g)      | 0.388 |
| ➤ Shell %               | 22.5  |
| ➤ Filament length (m)   | 978   |
| ➤ Raw silk (%)          | 17.8  |
| ➤ Denier (d)            | 2.92  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



## 5. CSR6

### Parentage:

- Shunrei x Shogetsu

### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Marked larvae with reddish tinge colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality : 2A ~ 3A grade

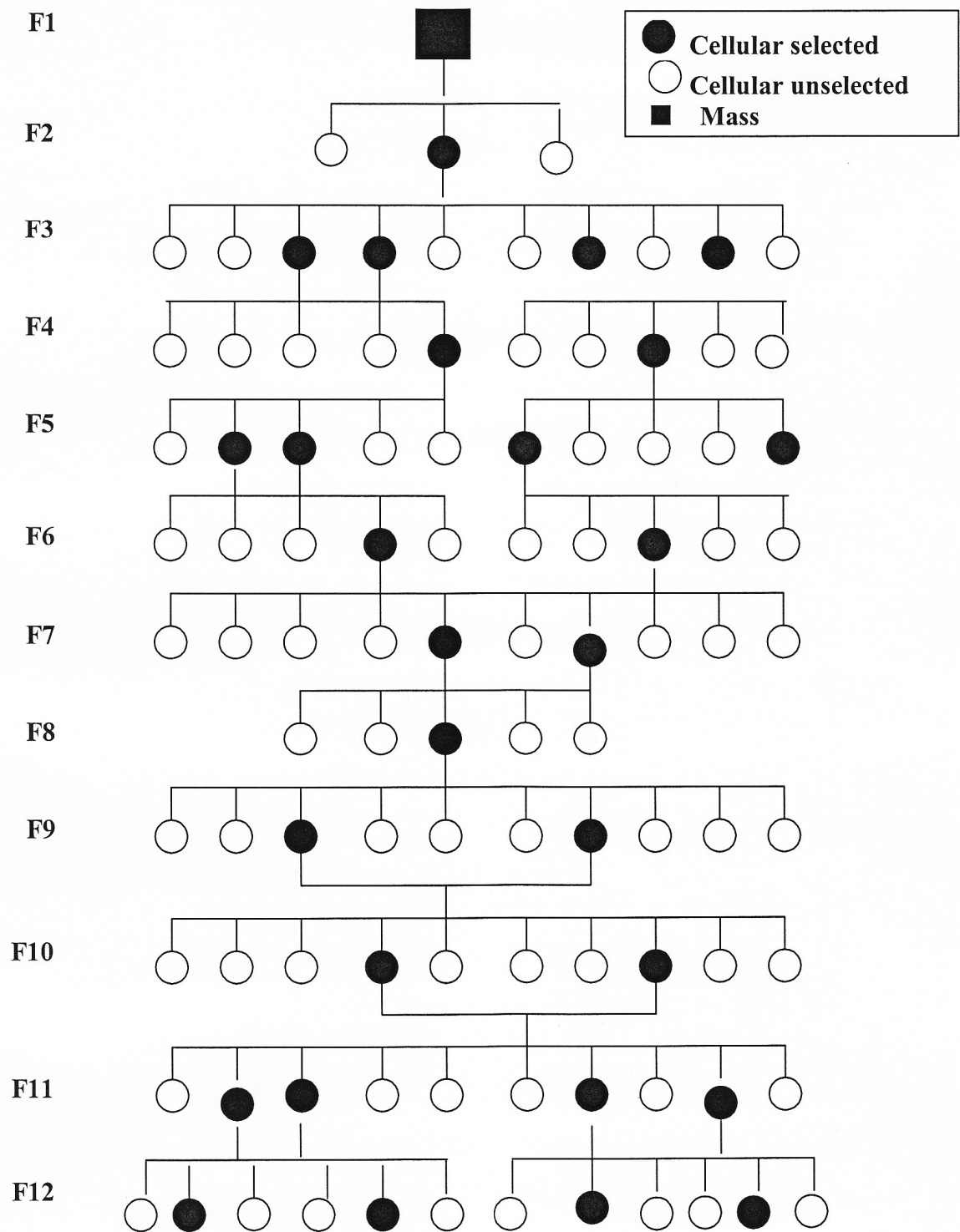
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 536   |
| ➤ Larval Duration (D:H) | 24:00 |
| ➤ Survival (%)          | 95.6  |
| ➤ Cocoon weight (g)     | 1.725 |
| ➤ Shell weight (g)      | 0.383 |
| ➤ Shell %               | 22.2  |
| ➤ Filament length (m)   | 965   |
| ➤ Raw silk (%)          | 17.6  |
| ➤ Denier (d)            | 2.83  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



## 6. CSR12

### Parentage:

- (BN18 x BC25) x KA

### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Marked and plain larvae with reddish tinge colour ( sex-limited)
- Bright white oval shaped cocoons with medium grains
- Fibre quality :2A ~ 3A grade

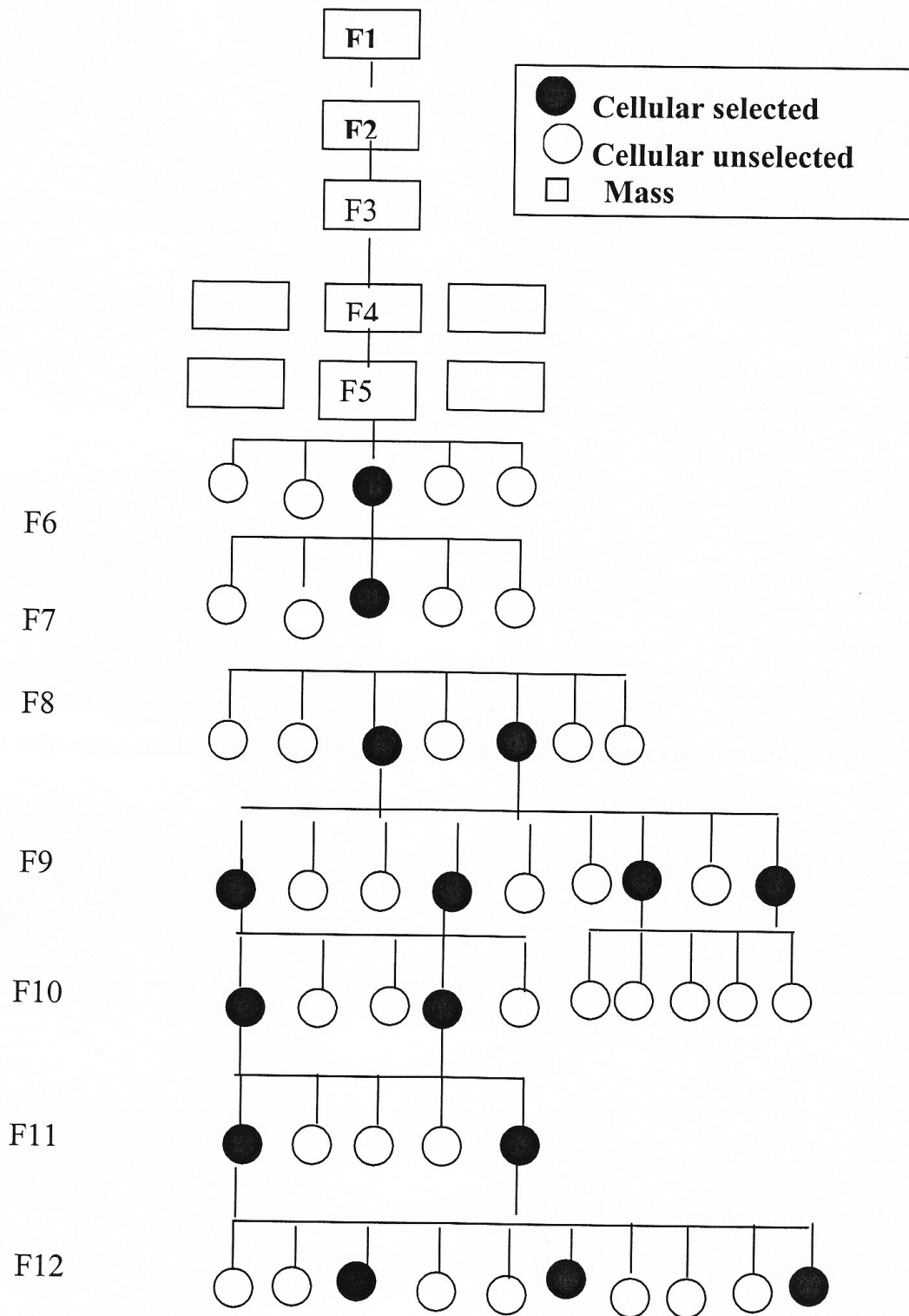
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 534   |
| ➤ Larval Duration (D:H) | 23:12 |
| ➤ Survival (%)          | 93.5  |
| ➤ Cocoon weight (g)     | 1.725 |
| ➤ Shell weight (g)      | 0.411 |
| ➤ Shell %               | 23.8  |
| ➤ Filament length (m)   | 994   |
| ➤ Raw silk (%)          | 17.2  |
| ➤ Denier (d)            | 2.91  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



## 7. CSR16

### Parentage :

- (C135 x N134) x J14

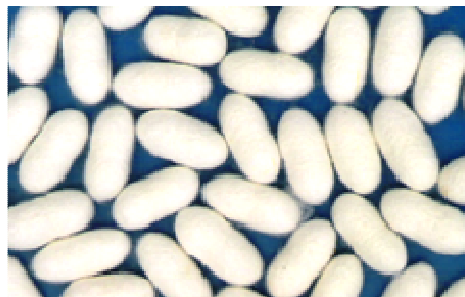
### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Marked larvae with reddish tinge colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality : 2A ~ 3A grade

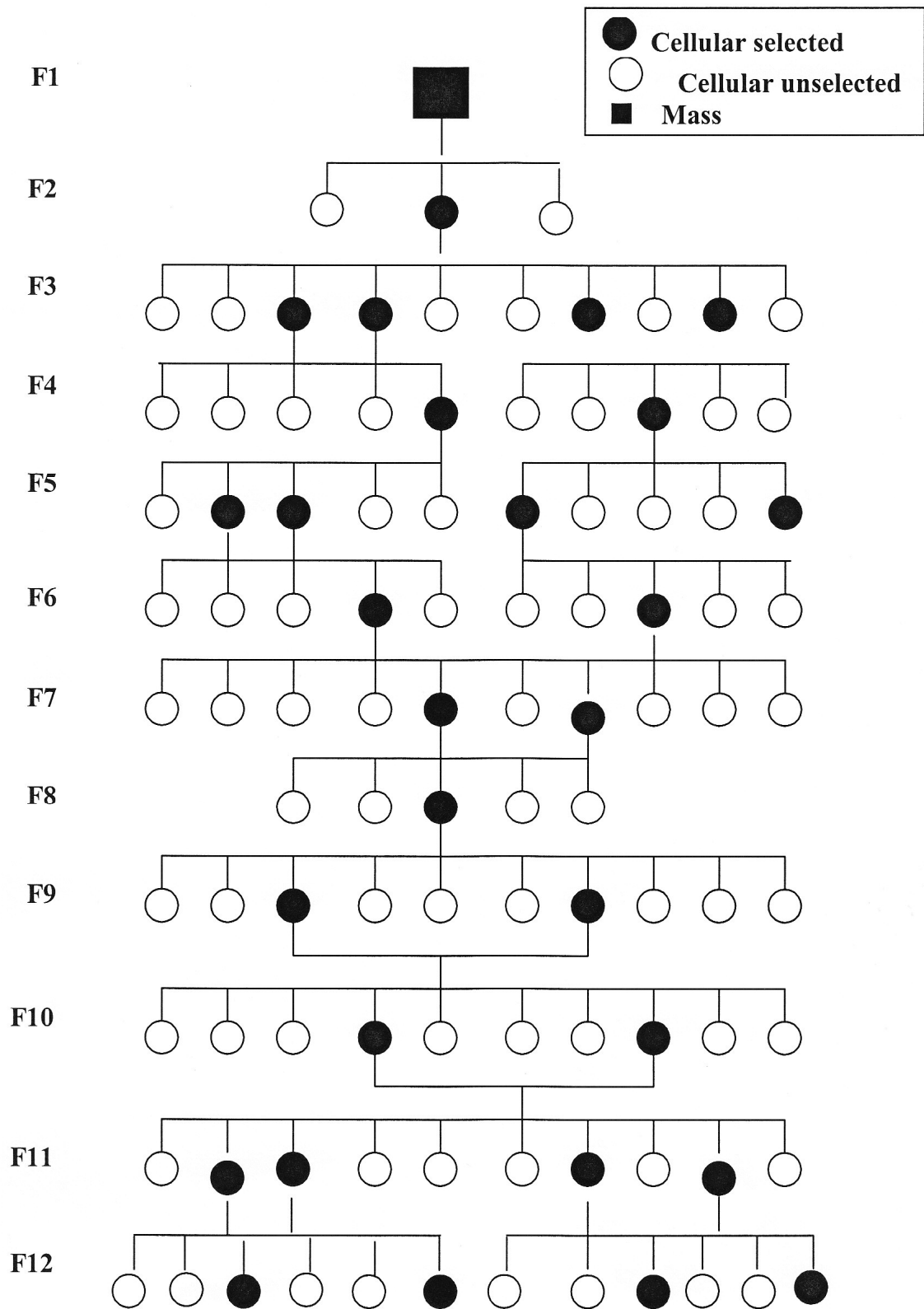
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 532   |
| ➤ Larval Duration (D:H) | 24:00 |
| ➤ Survival (%)          | 95.4  |
| ➤ Cocoon weight (g)     | 1.726 |
| ➤ Shell weight (g)      | 0.387 |
| ➤ Shell %               | 22.4  |
| ➤ Filament length (m)   | 968   |
| ➤ Raw silk (%)          | 18.2  |
| ➤ Denier (d)            | 2.82  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



## 8. CSR17

### Parentage:

- (N137 x C146) x A24

### Characteristics:

- Developed during 90s
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with fine to medium grains
- Fibre quality :2A -3A grade

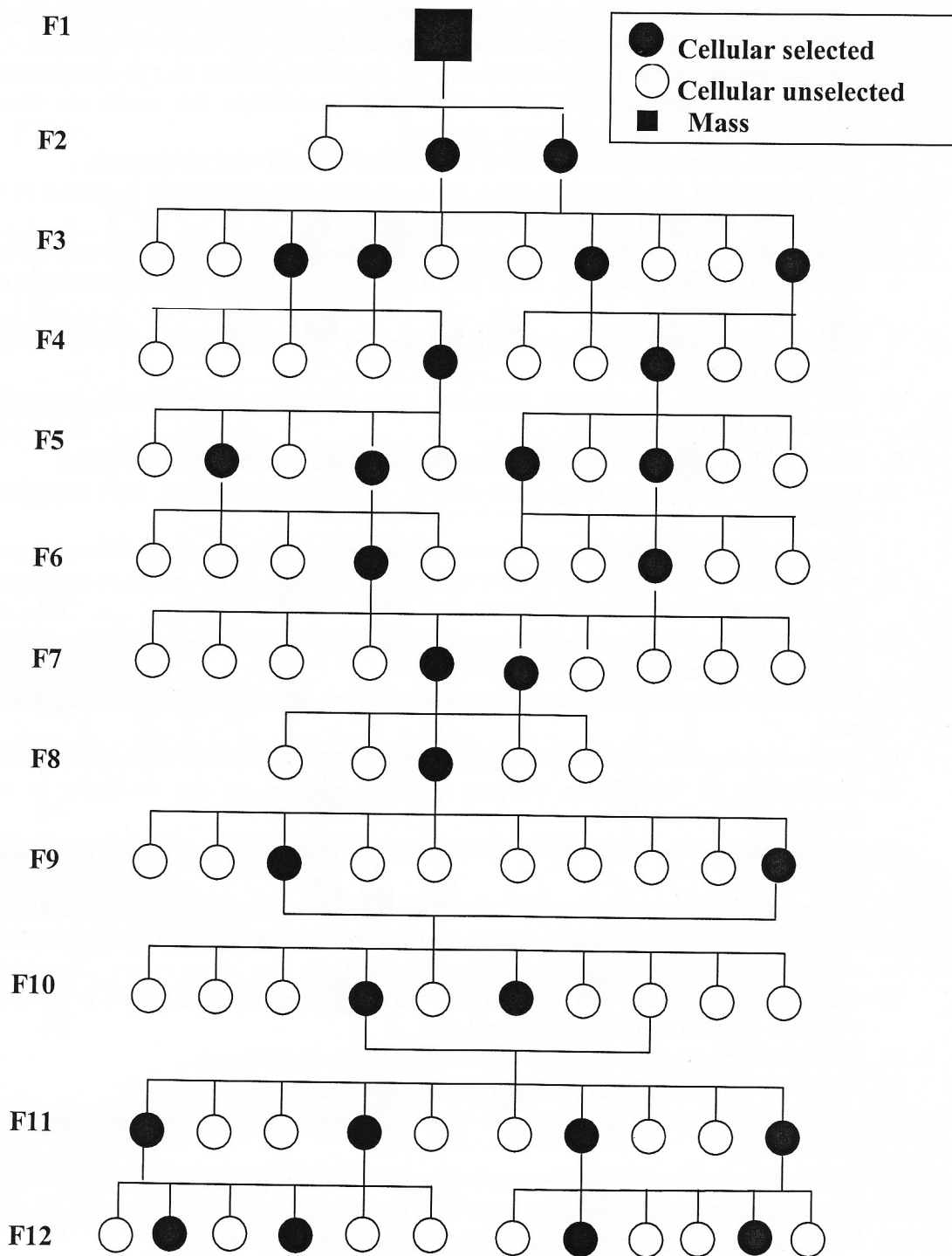
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df                | 551   |
| ➤ Larval Duration (D:H) | 23:00 |
| ➤ Survival (%)          | 94.9  |
| ➤ Cocoon weight (g)     | 1.800 |
| ➤ Shell weight (g)      | 0.421 |
| ➤ Shell %               | 23.4  |
| ➤ Filament length (m)   | 1025  |
| ➤ Raw silk (%)          | 18.2  |
| ➤ Denier (d)            | 2.79  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



**Breeding Plan:**



## 9. CSR18

### Parentage:

- B201 x BCS12

### Characteristics:

- Developed during 90s
- Robust breed with better post-cocoon parameters
- Developed under high temperature ( $36\pm 1^\circ\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Characterized by high pupation ( $>60\%$ ) under high temperature ( $36\pm 1^\circ\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Marked and plain larvae with reddish tinge colour (sex-limited)
- Larval duration one day less than other bivoltine breeds
- Creamish white oval shaped cocoons with medium grains
- Fibre quality: A-2A grade

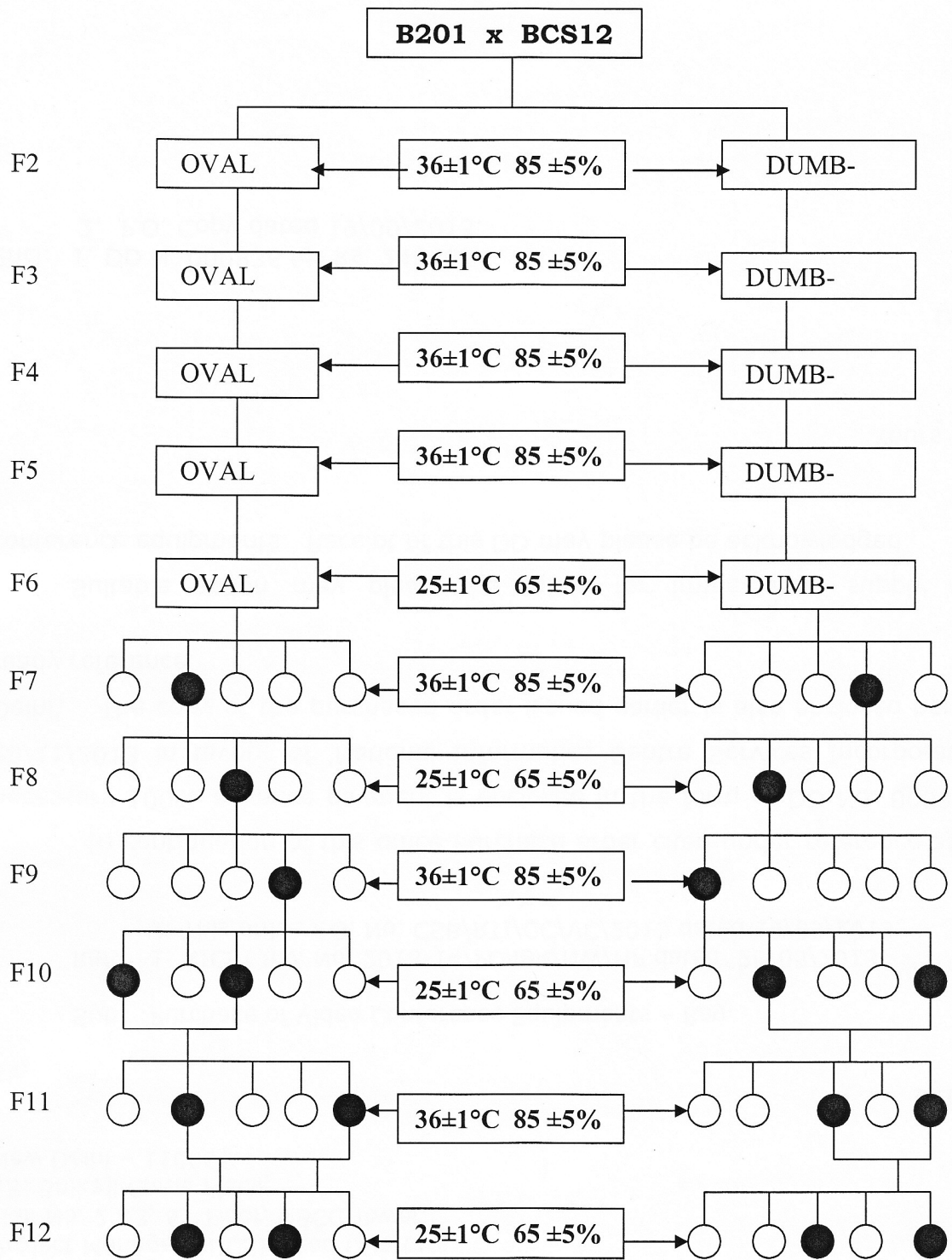
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df                | 538   |
| ➤ Larval Duration (D:H) | 22:12 |
| ➤ Survival (%)          | 95.6  |
| ➤ Cocoon weight (g)     | 1.720 |
| ➤ Shell weight (g)      | 0.390 |
| ➤ Shell %               | 22.7  |
| ➤ Filament length (m)   | 945   |
| ➤ Raw silk (%)          | 15.6  |
| ➤ Denier (d)            | 2.86  |
| ➤ Neatness (p)          | 91    |

### Larvae and Cocoons:



**Breeding Plan:**



## 10. CSR19

### Parentage:

- B201 x BCS12

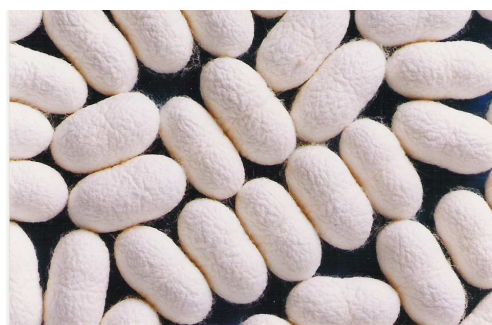
### Characteristics:

- Developed during 90s
- Robust breed with better post-cocoon parameters
- Developed under high temperature ( $36\pm 1^\circ\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Characterized by high pupation ( $>60\%$ ) under high temperature ( $36\pm 1^\circ\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Marked and plain larvae with reddish tinge colour (sex-limited)
- Larval duration one day less than other bivoltine breeds
- Creamish white dumbbell shaped cocoons with medium grains
- Fibre quality : A-2A grade

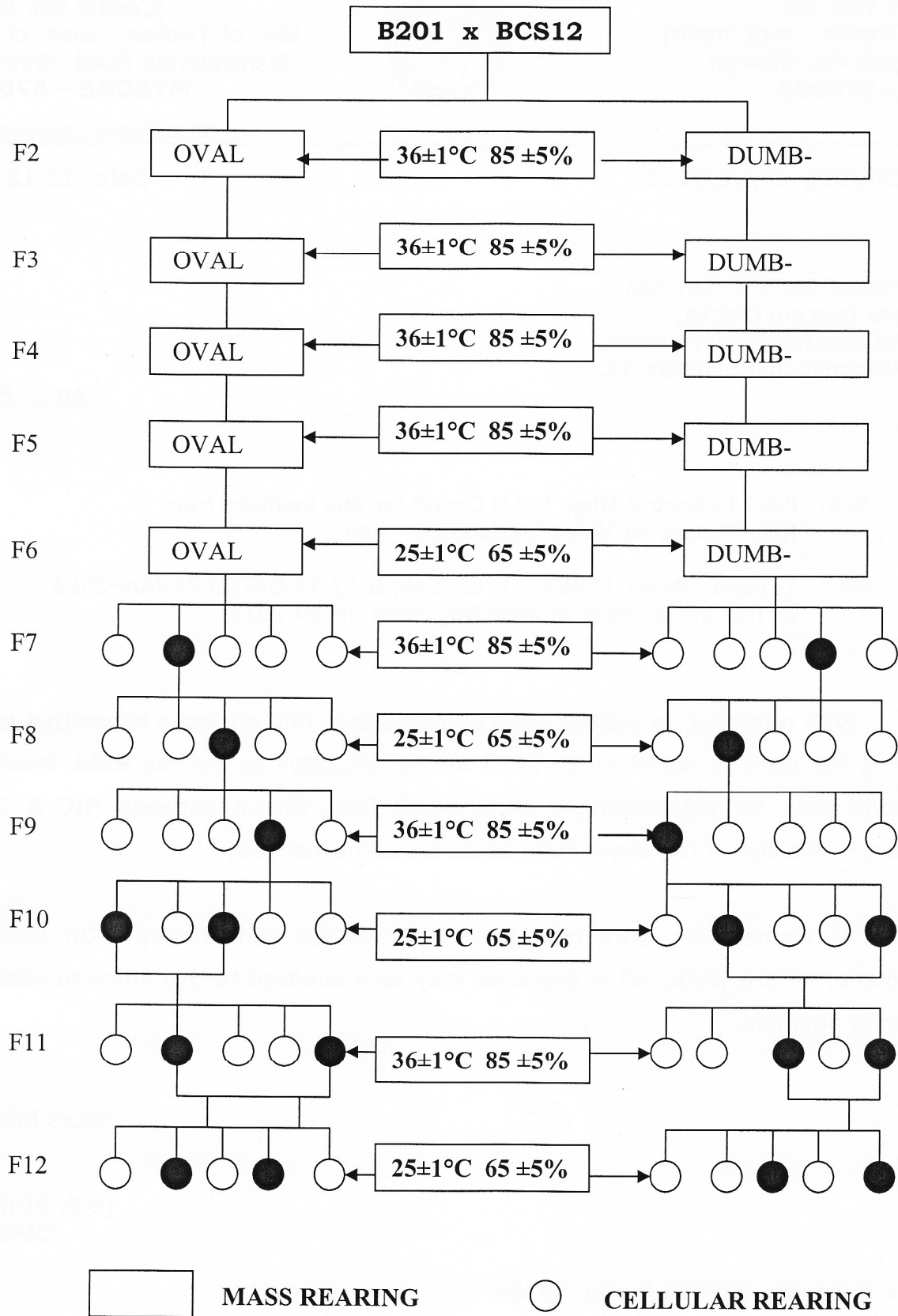
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df                | 513   |
| ➤ Larval Duration (D:H) | 22:12 |
| ➤ Survival (%)          | 95.4  |
| ➤ Cocoon weight (g)     | 1.569 |
| ➤ Shell weight (g)      | 0.336 |
| ➤ Shell %               | 21.4  |
| ➤ Filament length (m)   | 680   |
| ➤ Raw silk (%)          | 15.2  |
| ➤ Denier (d)            | 2.88  |
| ➤ Neatness (p)          | 92    |

### Larvae and Cocoons:



**Breeding Plan:**



## 11. CSR26

### Parentage:

- C135 x N134

### Characteristics:

- Developed during 2000
- Productive breed with better pre and post-cocoon parameters
- Marked larvae with reddish tinge colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality :2A - 3A grade

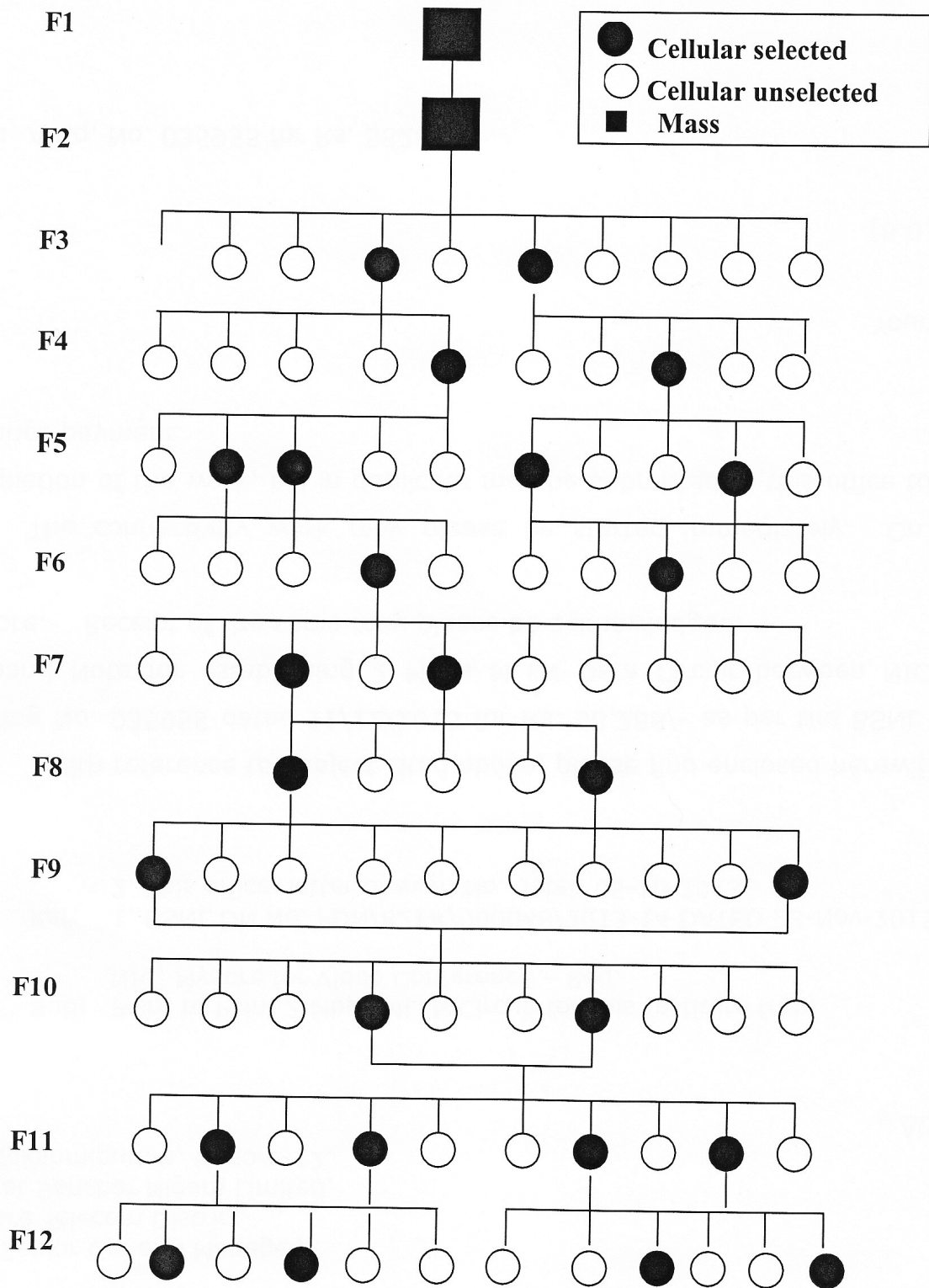
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 545   |
| ➤ Larval Duration (D:H) | 24:00 |
| ➤ Survival (%)          | 94.8  |
| ➤ Cocoon weight (g)     | 1.725 |
| ➤ Shell weight (g)      | 0.383 |
| ➤ Shell %               | 22.2  |
| ➤ Filament length (m)   | 975   |
| ➤ Raw silk (%)          | 17.2  |
| ➤ Denier (d)            | 2.89  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



## 12. CSR27

### Parentage:

- Thaihei x Choan

### Characteristics:

- Developed during 2000
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with medium grains
- Fibre quality: 2A - 3A grade

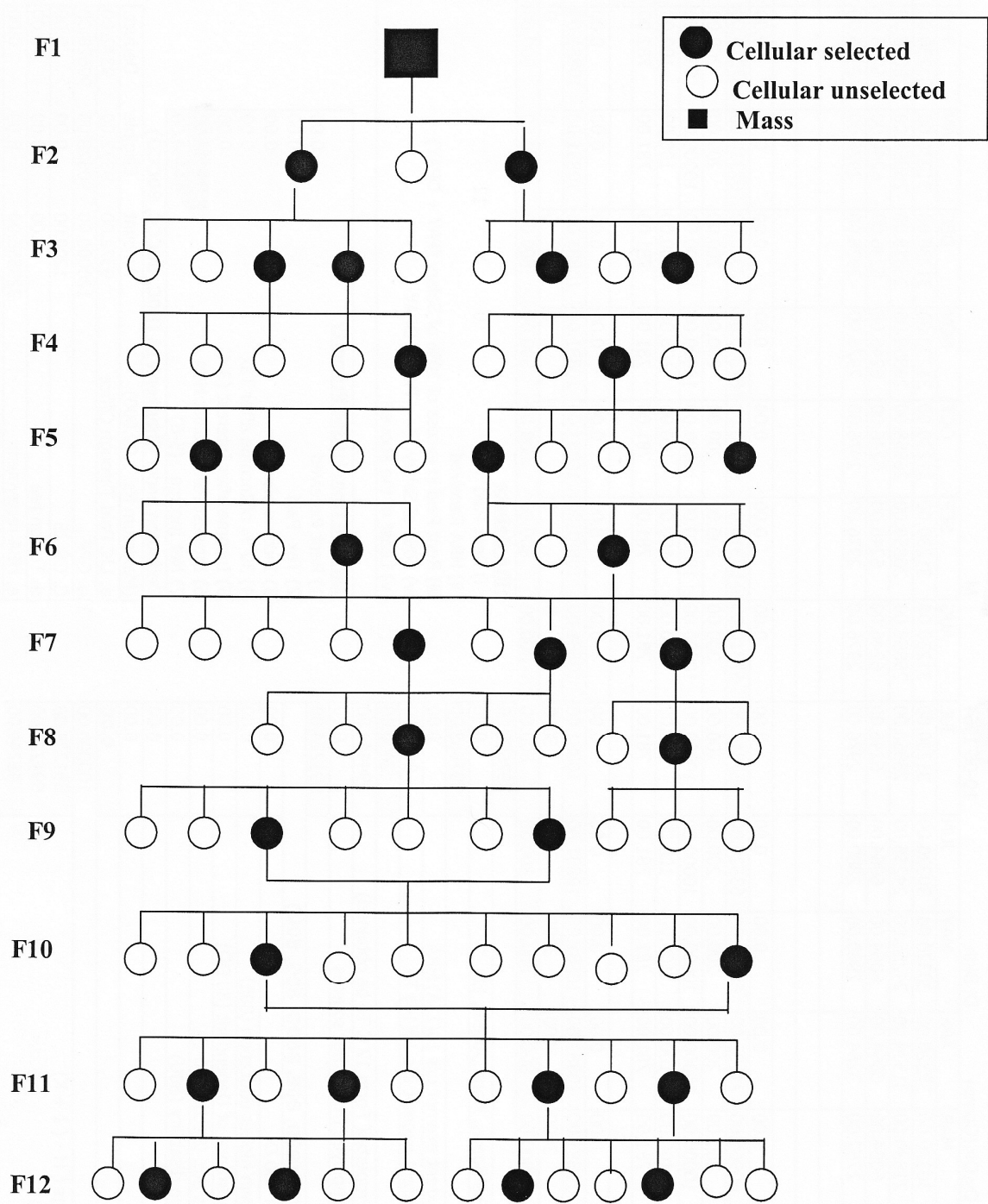
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/dfI               | 538   |
| ➤ Larval Duration (D:H) | 24:00 |
| ➤ Survival (%)          | 94.6  |
| ➤ Cocoon weight (g)     | 1.725 |
| ➤ Shell weight (g)      | 0.419 |
| ➤ Shell %               | 24.3  |
| ➤ Filament length (m)   | 1046  |
| ➤ Raw silk (%)          | 18.9  |
| ➤ Denier (d)            | 2.86  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



## Breeding Plan:



## 13. CSR46

### Parentage:

- CSR18 x CSR17

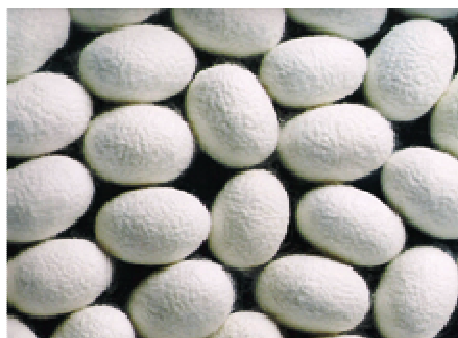
### Characteristics:

- Developed during 2000
- Developed under high temperature ( $36\pm 1^{\circ}\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Characterized by high pupation ( $>60\%$ ) under high temperature ( $36\pm 1^{\circ}\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with medium grains
- Fibre quality :2A -3A grade

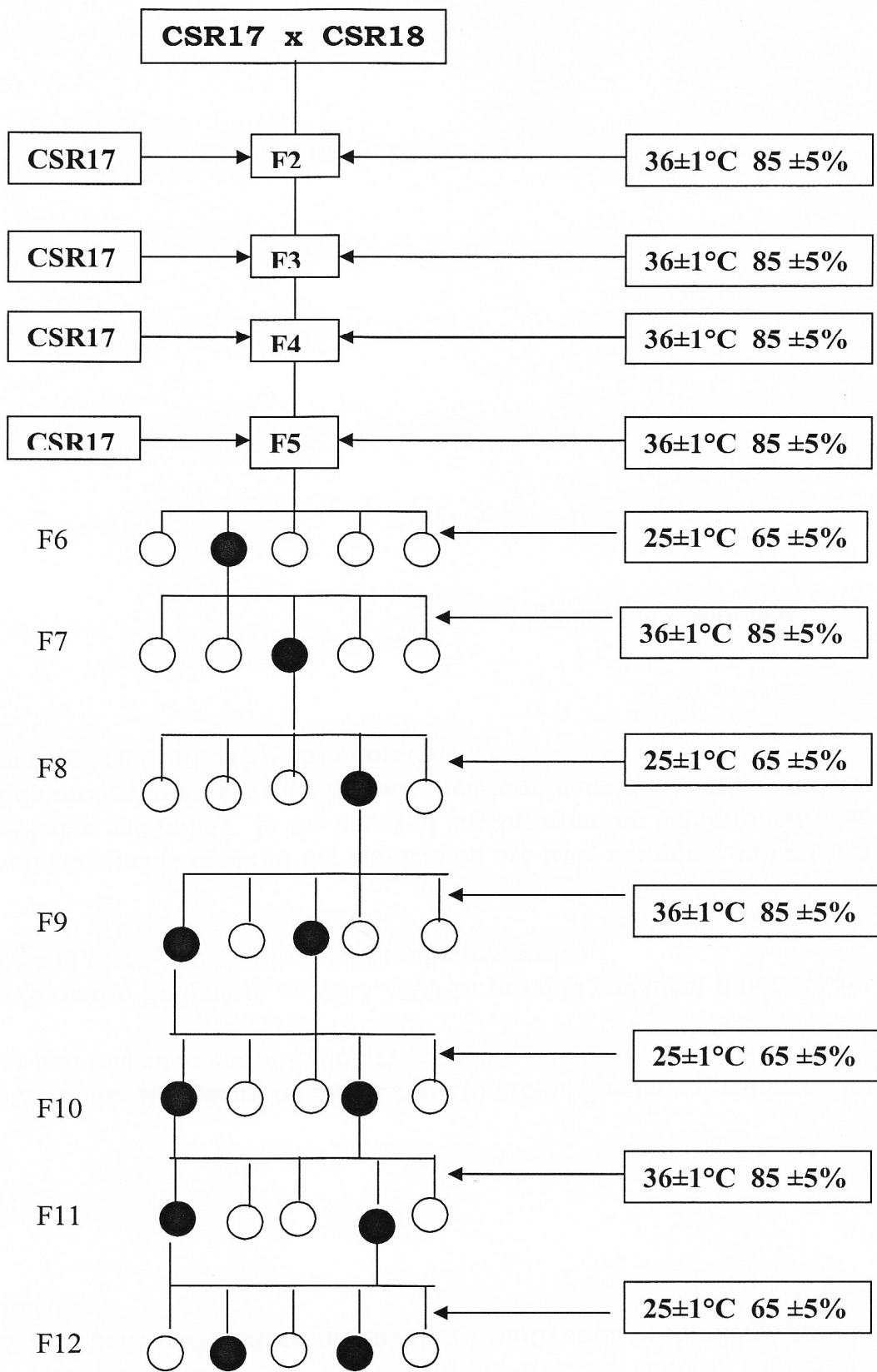
### Rearing and reeling traits:

➤ Egg/df	533
➤ Larval Duration (D:H)	23:00
➤ Survival (%)	95.2
➤ Cocoon weight (g)	1.750
➤ Shell weight (g)	0.403
➤ Shell %	23.0
➤ Filament length (m)	987
➤ Raw silk (%)	17.6
➤ Denier (d)	2.89
➤ Neatness (p)	94

### Larvae and Cocoons:



**Breeding Plan:**



## 14. CSR47

### Parentage:

- CSR4 x CSR19

### Characteristics:

- Developed during 2000
- Developed under high temperature ( $36\pm 1^{\circ}\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Characterized by high pupation ( $>60\%$ ) under high temperature ( $36\pm 1^{\circ}\text{C}$ ) and high humidity ( $85\pm 5\%$  RH) conditions
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality: 2A - 3A grade

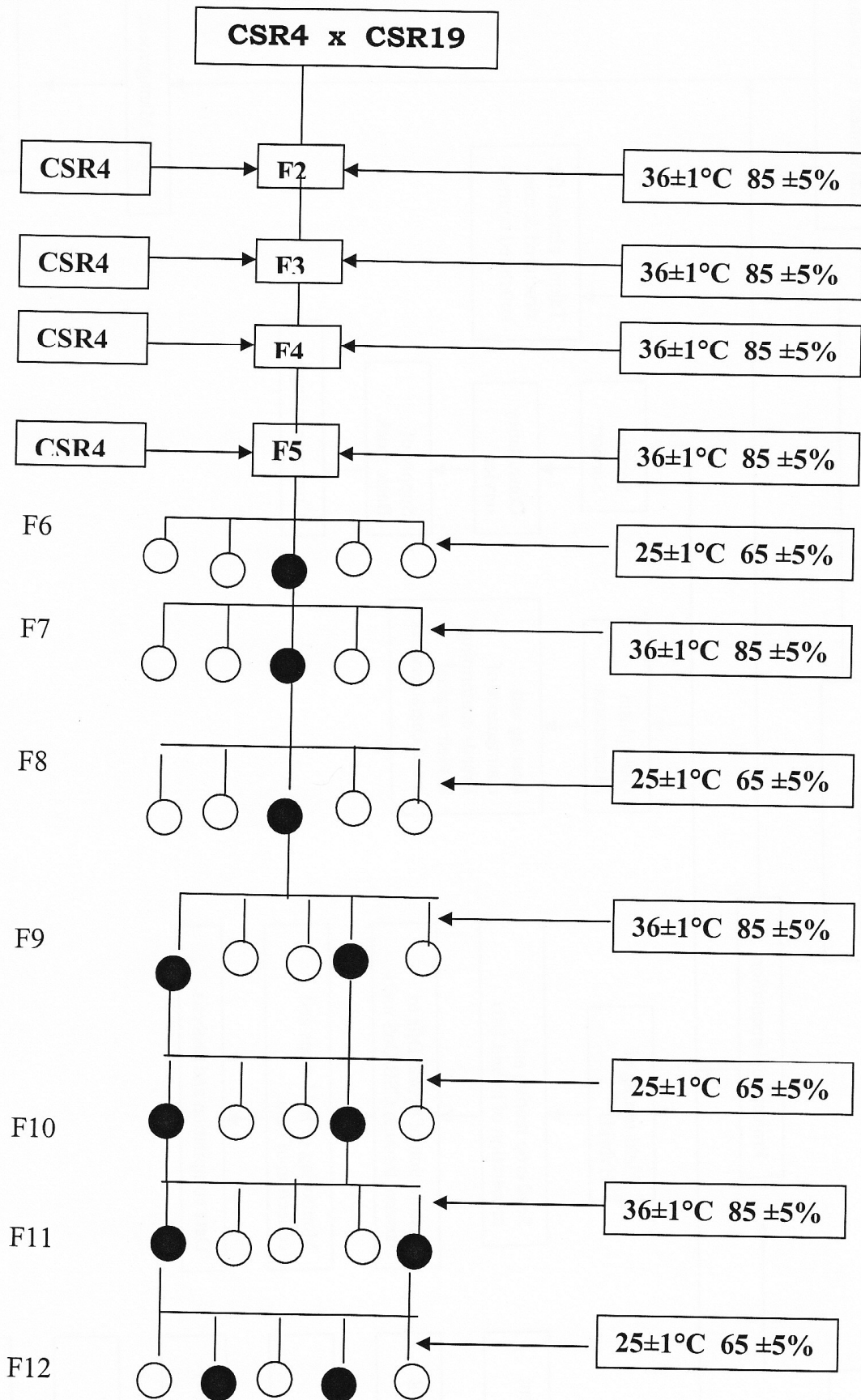
### Rearing and reeling traits:

➤ Egg/df	537
➤ Larval Duration (D:H)	23:00
➤ Survival (%)	95.3
➤ Cocoon weight (g)	1.780
➤ Shell weight (g)	0.401
➤ Shell %	22.5
➤ Filament length (m)	974
➤ Raw silk (%)	16.3
➤ Denier (d)	2.87
➤ Neatness (p)	93

### Larvae and Cocoons:



**Breeding Plan:**



## 15. CSR48

### Parentage:

- (BN18 x BN19) x (BCS18 x BCS19)

### Characteristics:

- Developed during 1997
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with medium grains
- Longer filament length and thin denier
- Fibre quality :2A- 3A grade

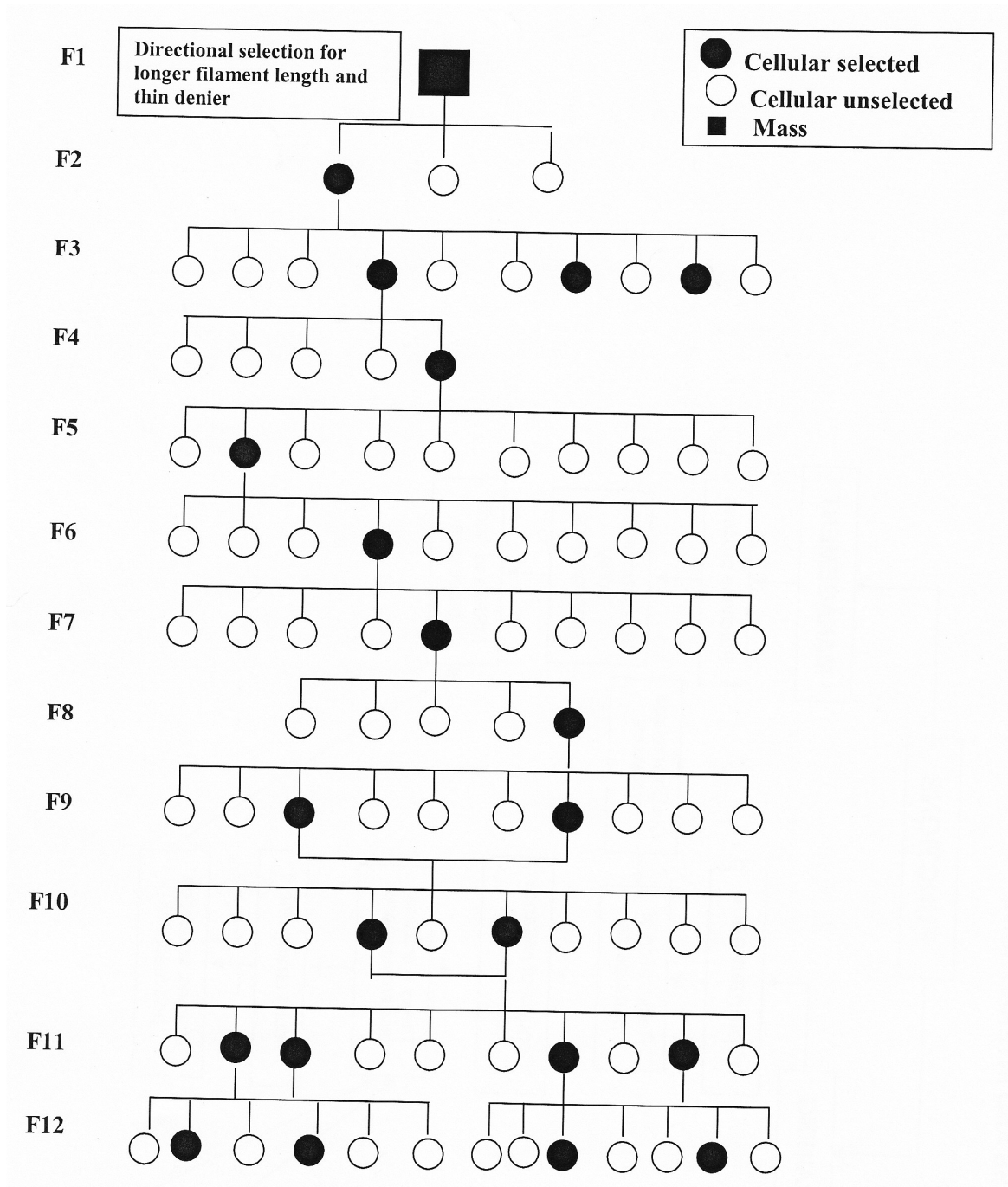
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 536   |
| ➤ Larval Duration (D:H) | 23:00 |
| ➤ Survival (%)          | 93.9  |
| ➤ Cocoon weight (g)     | 1.730 |
| ➤ Shell weight (g)      | 0.388 |
| ➤ Shell %               | 22.4  |
| ➤ Filament length (m)   | 1350  |
| ➤ Raw silk (%)          | 16.5  |
| ➤ Denier (d)            | 2.48  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



## Breeding Plan:



## 16. CSR50

### Parentage:

- CSR202 x CSR46

### Characteristics:

- Developed during 2005
- High temperature and disease tolerant breed
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with medium grains
- Fibre quality :2A -3A grade

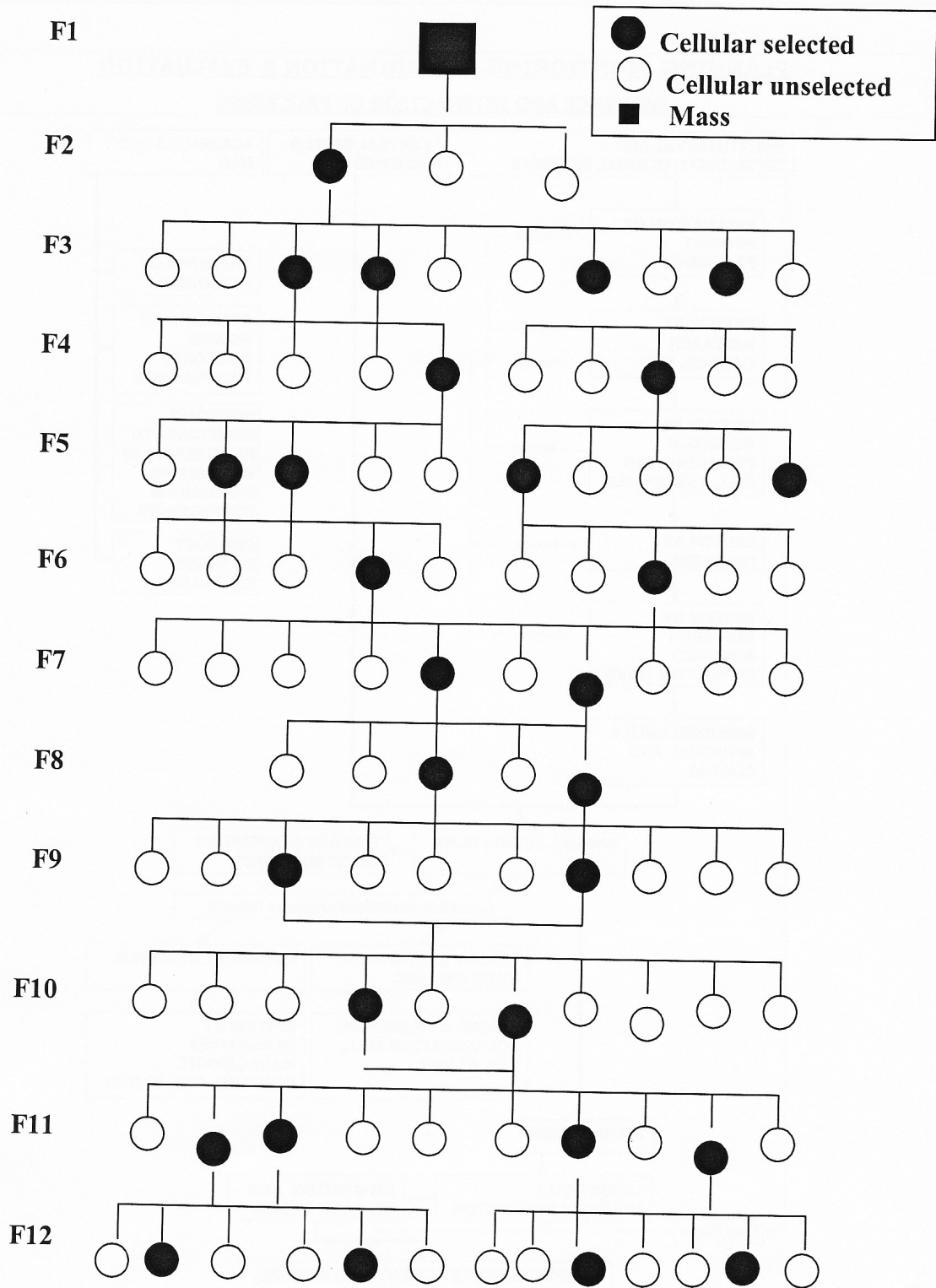
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 544   |
| ➤ Larval Duration (D:H) | 23:12 |
| ➤ Survival (%)          | 95.0  |
| ➤ Cocoon weight (g)     | 1.825 |
| ➤ Shell weight (g)      | 0.433 |
| ➤ Shell %               | 23.7  |
| ➤ Filament length (m)   | 1052  |
| ➤ Raw silk (%)          | 18.2  |
| ➤ Denier (d)            | 2.86  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



**Breeding Plan:**



## 17. CSR51

### Parentage:

- 9HT x CSR16

### Characteristics:

- Developed during 2005
- High temperature and disease tolerant breed
- Productive breed with better pre and post-cocoon parameters
- Marked larvae with bluish white body colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality :2A -3A grade

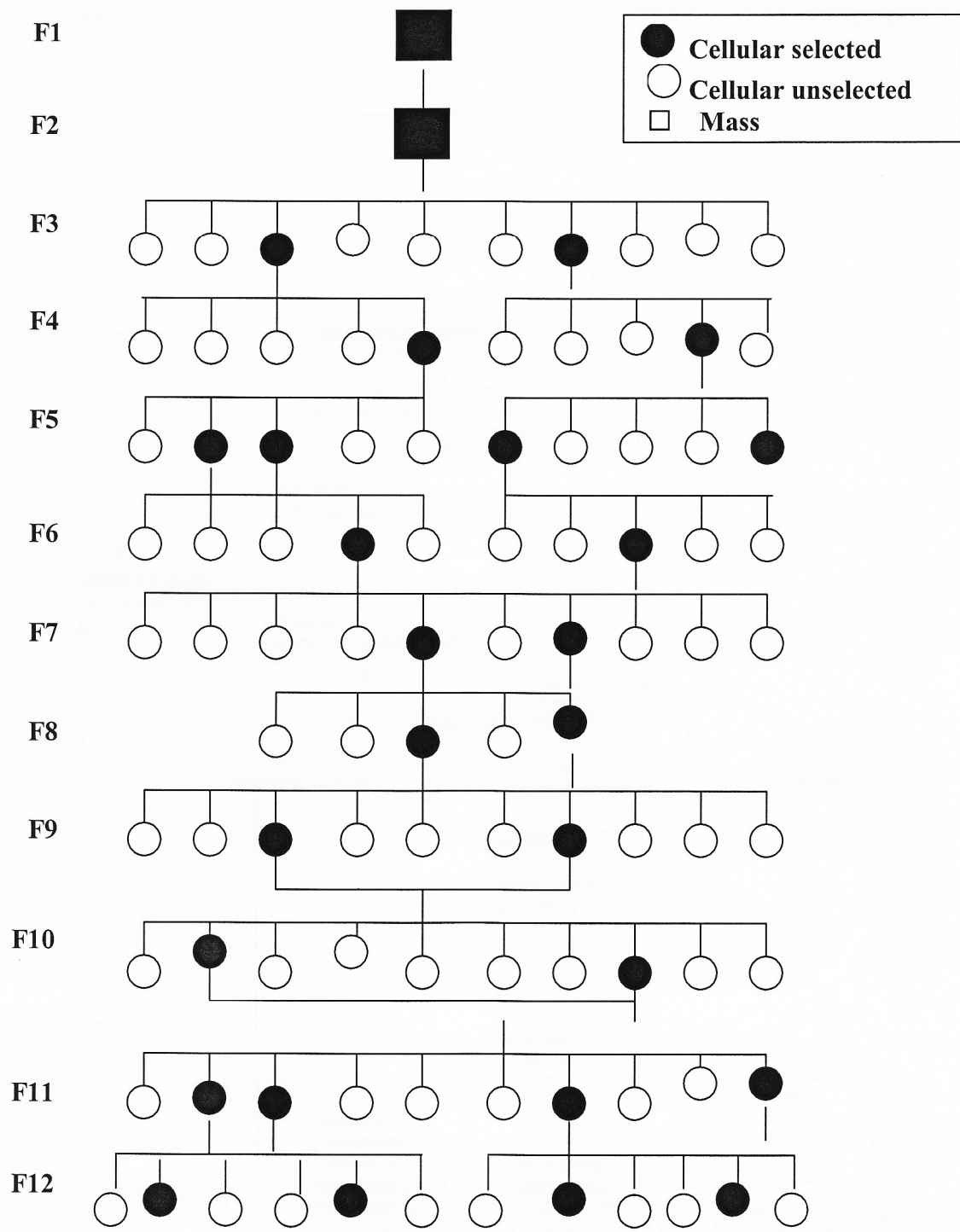
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 538   |
| ➤ Larval Duration (D:H) | 23.00 |
| ➤ Survival (%)          | 94.5  |
| ➤ Cocoon weight (g)     | 1.750 |
| ➤ Shell weight (g)      | 0.397 |
| ➤ Shell %               | 22.7  |
| ➤ Filament length (m)   | 975   |
| ➤ Raw silk (%)          | 17.3  |
| ➤ Denier (d)            | 2.82  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



**Breeding Plan:**



## 18. CSR52

### Parentage:

- Daizo x 10 HT

### Characteristics:

- Developed during 2005
- Productive breed with better pre and post-cocoon parameters
- Plain larvae with bluish white body colour
- Bright white oval shaped cocoons with medium grains
- Fibre quality :2A- 3A grade

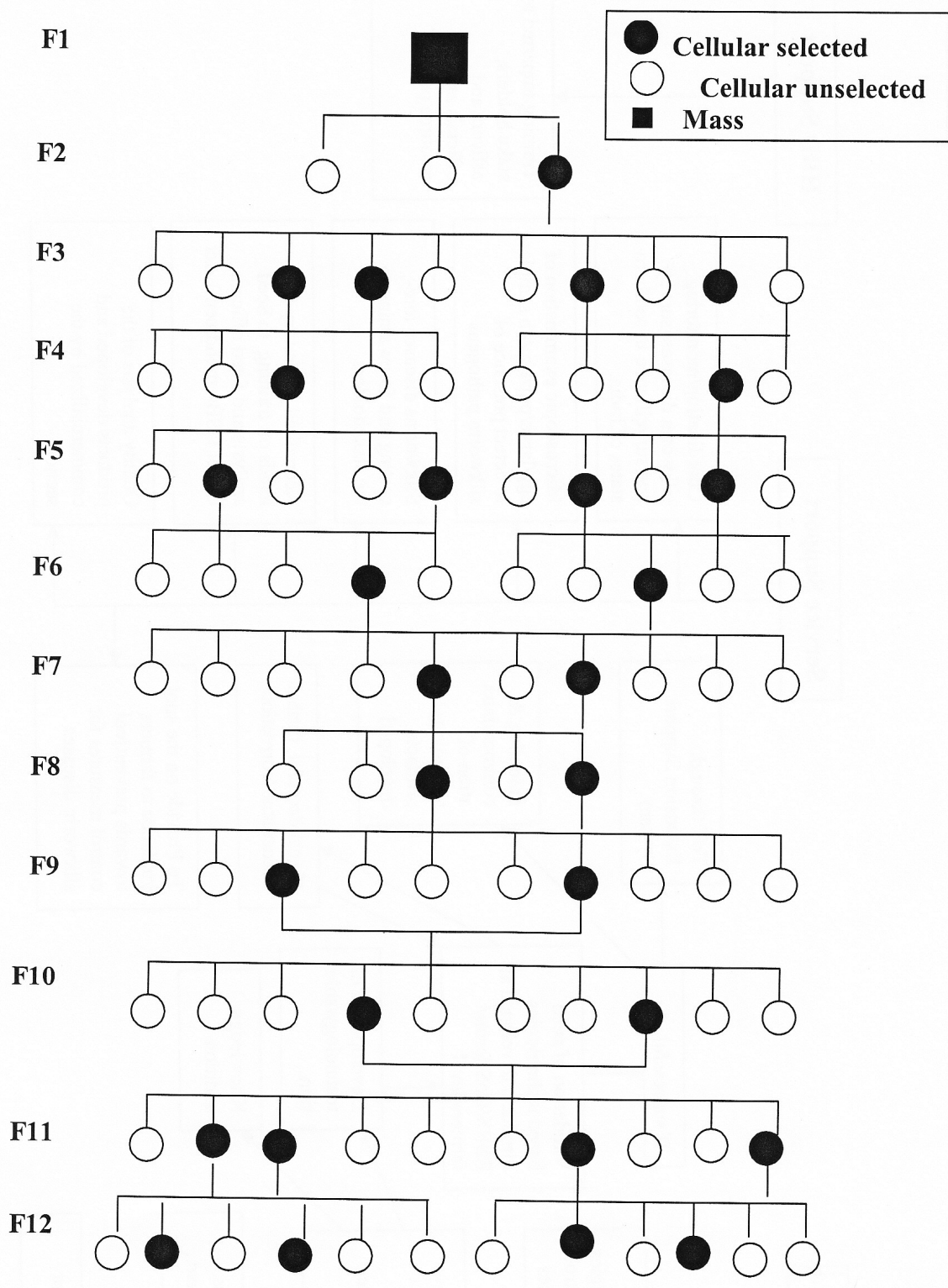
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 548   |
| ➤ Larval Duration (D:H) | 23.00 |
| ➤ Survival (%)          | 95.6  |
| ➤ Cocoon weight (g)     | 1.800 |
| ➤ Shell weight (g)      | 0.419 |
| ➤ Shell %               | 23.3  |
| ➤ Filament length (m)   | 1032  |
| ➤ Raw silk (%)          | 18.2  |
| ➤ Denier (d)            | 2.92  |
| ➤ Neatness (p)          | 94    |

### Larvae and Cocoons:



**Breeding Plan:**



## 19. CSR53

### Parentage:

- CSR203x CSR47

### Characteristics:

- Developed during 2005
- Productive breed with better pre and post-cocoon parameters
- Marked larvae with bluish white body colour
- Bright white dumbbell shaped cocoons with medium grains
- Fibre quality :2A ~ 3A grade

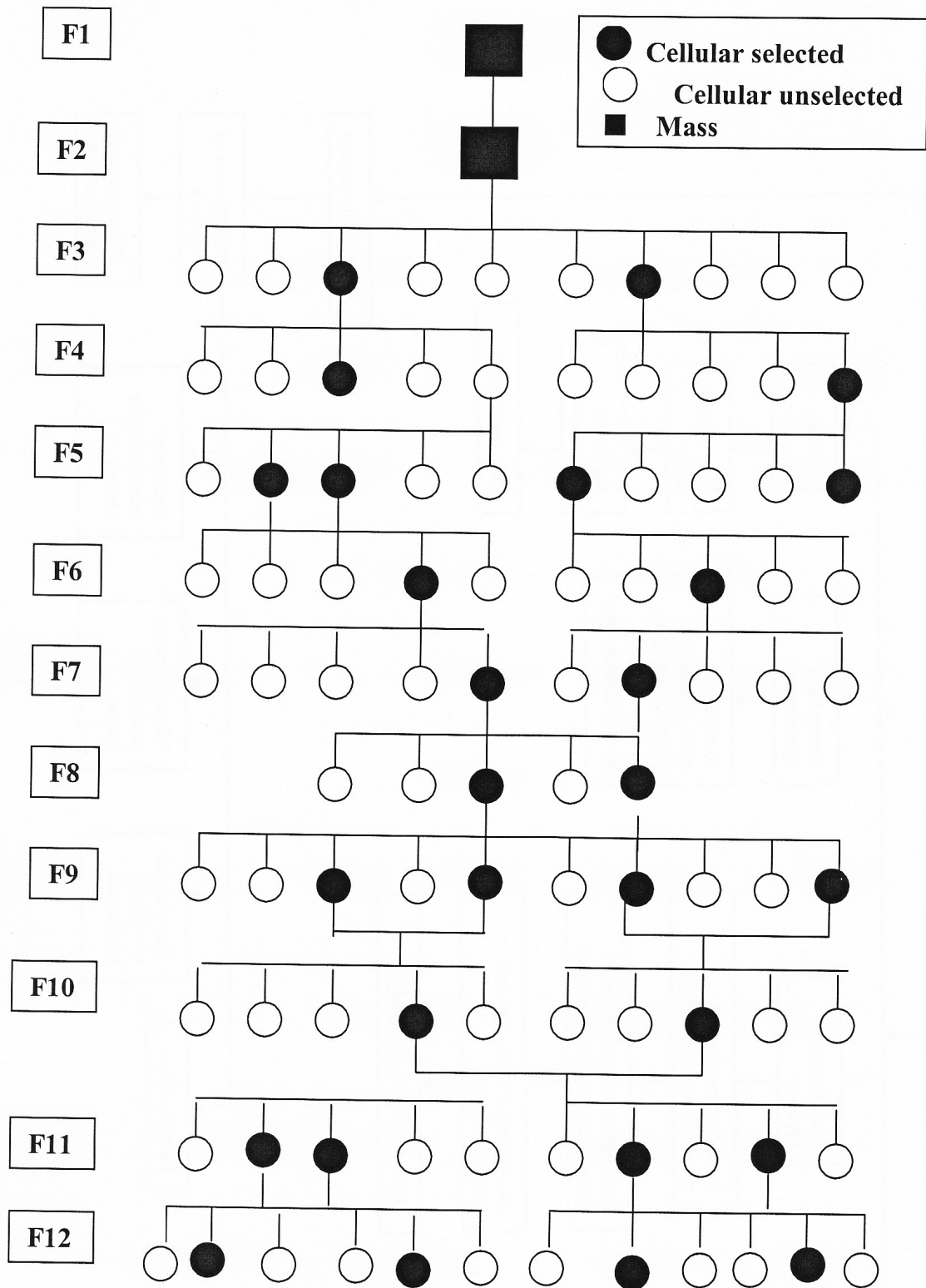
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 545   |
| ➤ Larval Duration (D:H) | 24.00 |
| ➤ Survival (%)          | 94.3  |
| ➤ Cocoon weight (g)     | 1.755 |
| ➤ Shell weight (g)      | 0.397 |
| ➤ Shell %               | 22.6  |
| ➤ Filament length (m)   | 986   |
| ➤ Raw silk (%)          | 17.2  |
| ➤ Denier (d)            | 2.96  |
| ➤ Neatness (p)          | 93    |

### Larvae and Cocoons:



**Breeding Plan:**



## 20. CSR2 (SL)

### Parentage:

- CC1 (SL) x CSR2

### Characteristics:

- Developed during 2005
- Easy separation of female and male based on cocoon colour (yellow Female, White - male).
- The male cocoons (white) can be utilized for preparation of cross breed layings.
- The female cocoon (yellow) can be sent for reeling.
- Fibre quality :A grade

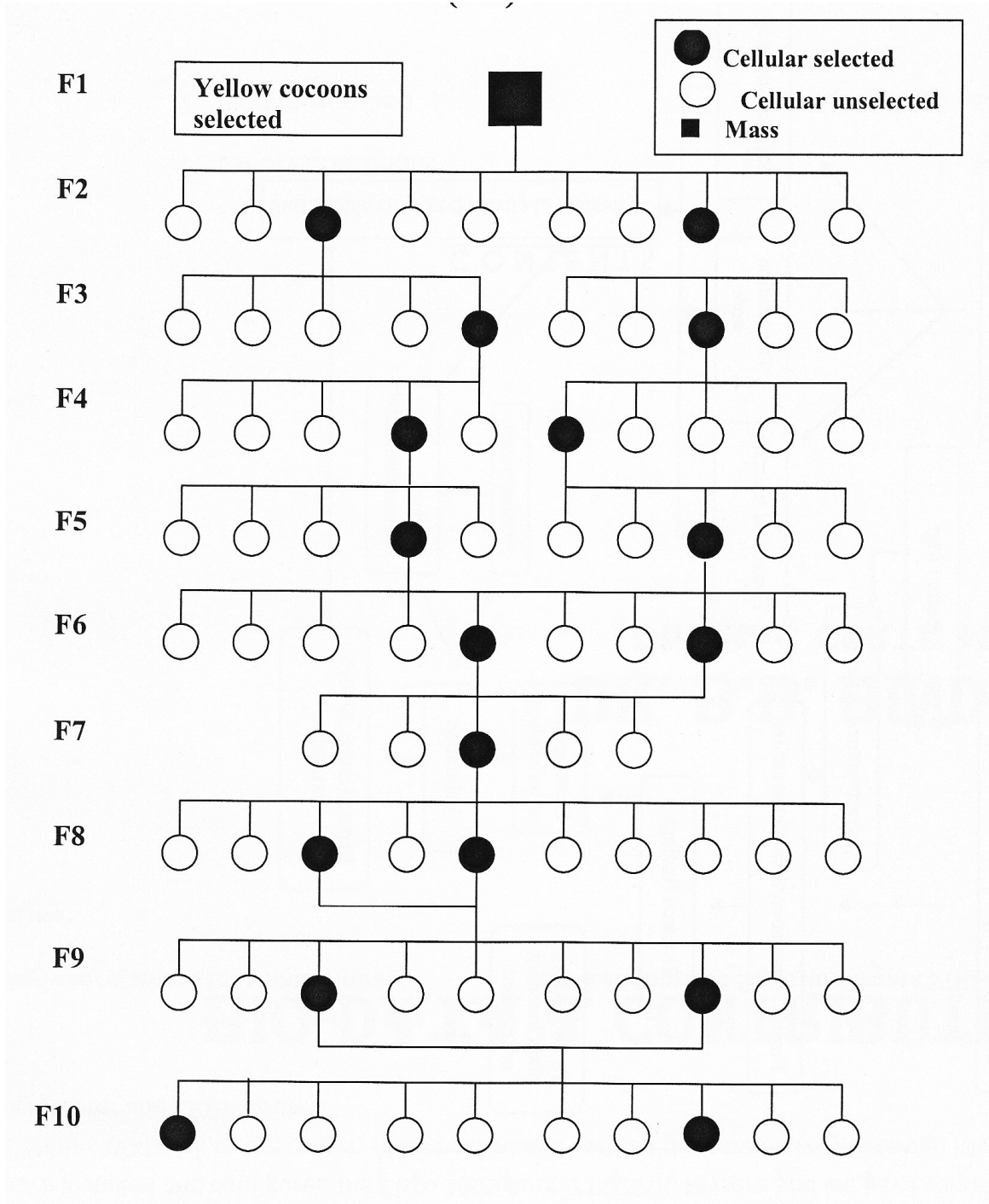
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 481   |
| ➤ Larval Duration (D:H) | 22.00 |
| ➤ Survival (%)          | 93.6  |
| ➤ Cocoon weight (g)     | 1.700 |
| ➤ Shell weight (g)      | 0.372 |
| ➤ Shell %               | 21.9  |
| ➤ Filament length (m)   | 860   |
| ➤ Raw silk (%)          | 15.0  |
| ➤ Denier (d)            | 2.76  |
| ➤ Neatness (p)          | 91    |

### Larvae and Cocoons:



**Breeding Plan:**



## 21. CSR8 (SL)

### Parentage:

- Japanese hybrid (SL) x NB4D2

### Characteristics:

- Developed during 2005
- Easy separation of female and male based on cocoon colour (yellow Female, White - male).
- The male cocoons (white) can be utilized for preparation of cross breed layings. The female cocoon (yellow) can be sent for reeling.
- Fibre quality : A grade

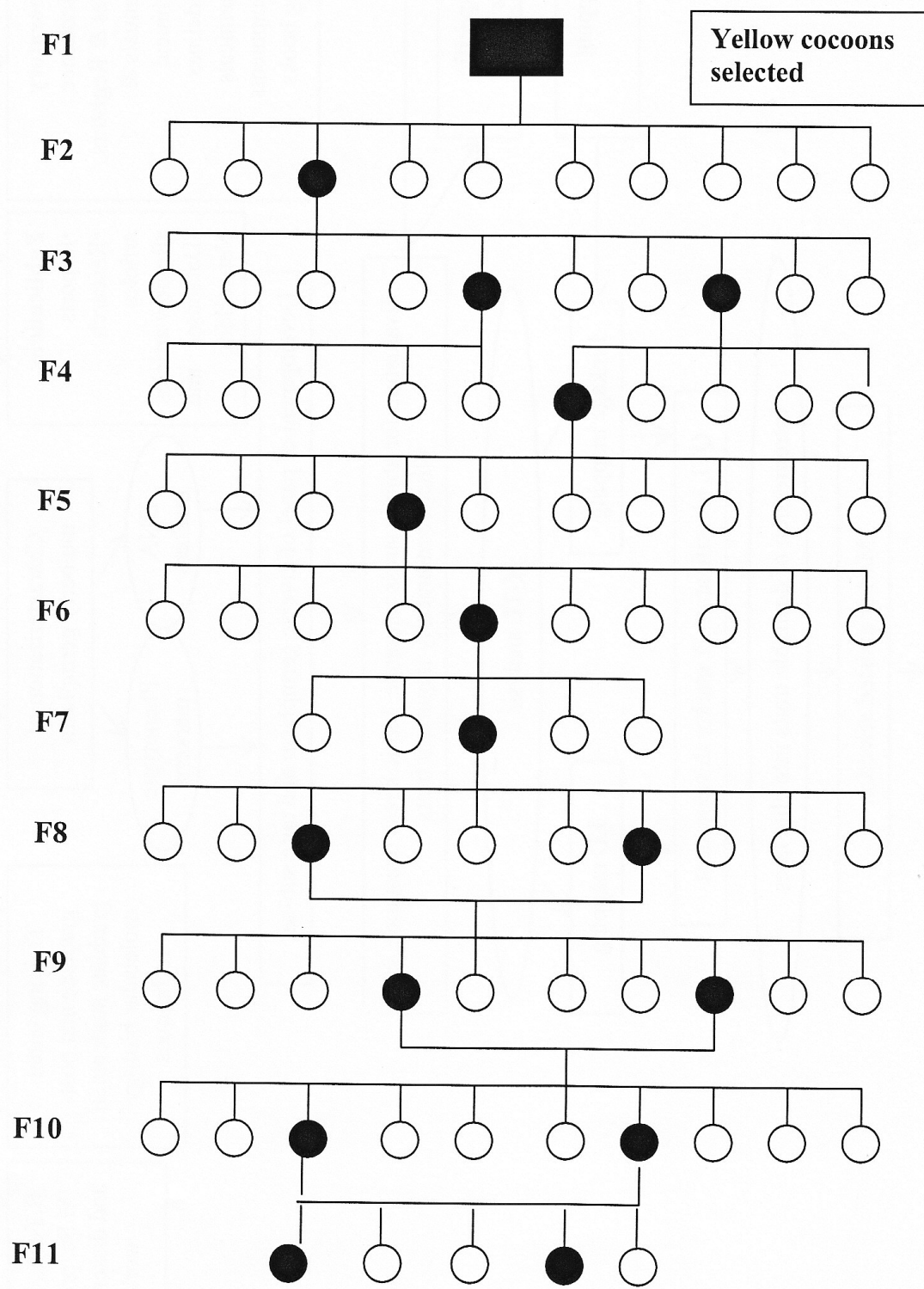
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df1               | 486   |
| ➤ Larval Duration (D:H) | 22.00 |
| ➤ Survival (%)          | 94.8  |
| ➤ Cocoon weight (g)     | 1.663 |
| ➤ Shell weight (g)      | 0.343 |
| ➤ Shell %               | 20.6  |
| ➤ Filament length (m)   | 865   |
| ➤ Raw silk (%)          | 14.5  |
| ➤ Denier (d)            | 2.79  |
| ➤ Neatness (p)          | 91    |

### Larvae and Cocoons:



**Breeding Plan:**



## 22. GEN2

### Parentage:

- Nistari and CSR5

### Characteristics:

- Developed during 2005
- Developed by introgressing amylase genes from multivoltine breed Nistari into CSR5
- Plain larvae, dumbbell shape, creamish white cocoons
- Better digestibility & higher survival under sub-optimal conditions of leaf quality and rearing management

### Rearing and reeling traits:

➤ Egg/df	532
➤ Larval Duration (D:H)	22.06
➤ Survival (%)	90.2
➤ Cocoon weight (g)	1.78
➤ Shell weight (g)	0.390
➤ Shell %	22.0
➤ Filament length (m)	938
➤ Raw silk (%)	15.5
➤ Denier (d)	2.69
➤ Neatness (p)	91

### Larvae and Cocoons:





## 22. GEN3

### Parentage:

- PM and CSR2

### Characteristics:

- Developed during 2005
- Developed by introgressing amylase genes from multivoltine breed PM into CSR2
- Plain larvae, oval shape, creamish white cocoons
- Better digestibility & higher survival under sub-optimal conditions of leaf quality and rearing management

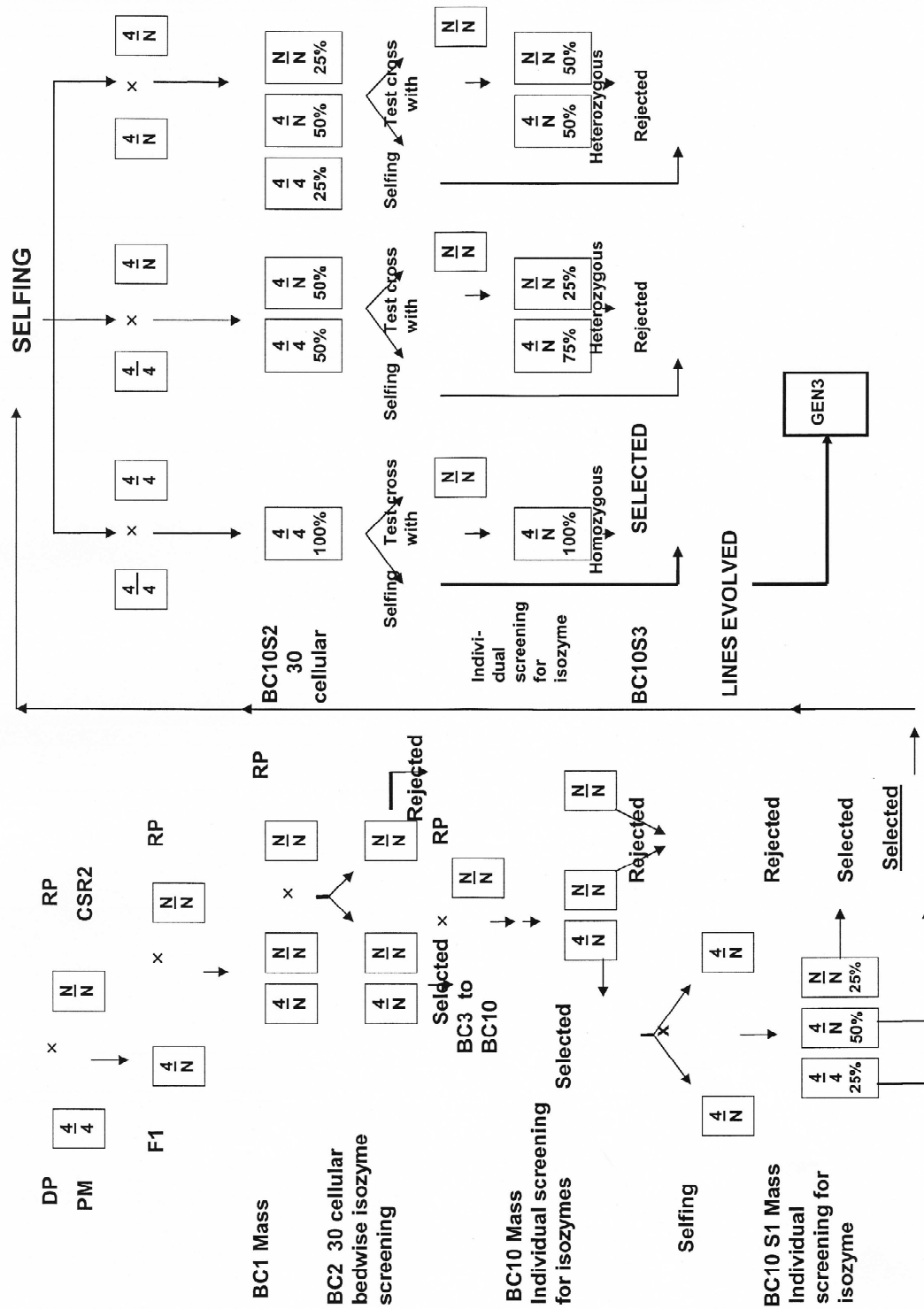
### Rearing and reeling traits:

- |                         |       |
|-------------------------|-------|
| ➤ Egg/df                | 539   |
| ➤ Larval Duration (D:H) | 22.12 |
| ➤ Survival (%)          | 94.1  |
| ➤ Cocoon weight (g)     | 1.93  |
| ➤ Shell weight (g)      | 0.440 |
| ➤ Shell %               | 22.8  |
| ➤ Filament length (m)   | 1028  |
| ➤ Raw silk (%)          | 16.5  |
| ➤ Denier (d)            | 2.72  |
| ➤ Neatness (p)          | 95    |

### Larvae and Cocoons:



**Breeding Plan:**



Scientists/ Experts contributed towards development of silkworm breeds

- 1.Dr.R.K.Datta
- 2.Dr.S.B.Dandin
- 3.Dr.C.K.Kamble
- 4.Dr.M.M.Ahsan
- 5.Dr.H.K.Basavaraja
- 6.Dr.S.Nirmal Kumar
- 7.Dr.B.K.Kariyappa
- 8.Dr.K.P.Jayasawal
- 9.Dr.N.Mal Reddy
- 10.Dr.N.Suresh Kumar
- 11.Dr.S.K.Aswath
- 12.Dr.A.Naseema Begum
- 13.Dr.M.Ramesh Babu
- 14.Dr.G.V.Kalpna
- 15.Dr.P.G.Joge
- 16.Dr.C.M.Kishore Kumar
- 17.Dr.N.Morrison
- 18.Dr.M.B.V.Subbiah
- 19.Dr.B.Nataraju
- 20.Dr.Nanje Gowda
- 21.Mr.A.K.Palit



*Published by:*

**Dr. B.B. Bindroo**

Director

**Central Sericultural Research & Training Institute,**

[An ISO 9001 : 2008 certified]

[Central Silk Board – Min. of Textiles – Govt. of India]

Manandavadi Road, Srirampura, Mysore – 570 008

Website [www.csrtimys.res.in](http://www.csrtimys.res.in) ♦ email: [csrtimys.csb@nic.in](mailto:csrtimys.csb@nic.in)