

Outline

- Mapping and confirmation of the location of an RB resistance gene in the Japanese cultivar 'Hyuuga'
- Identifying genetic variation in MG 000 to X germplasm accessions

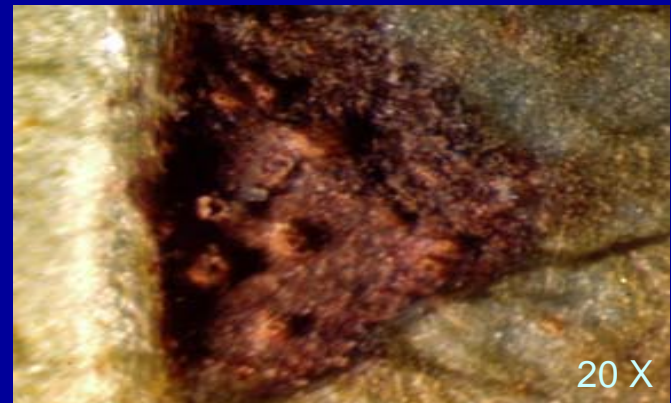


Types of Lesion

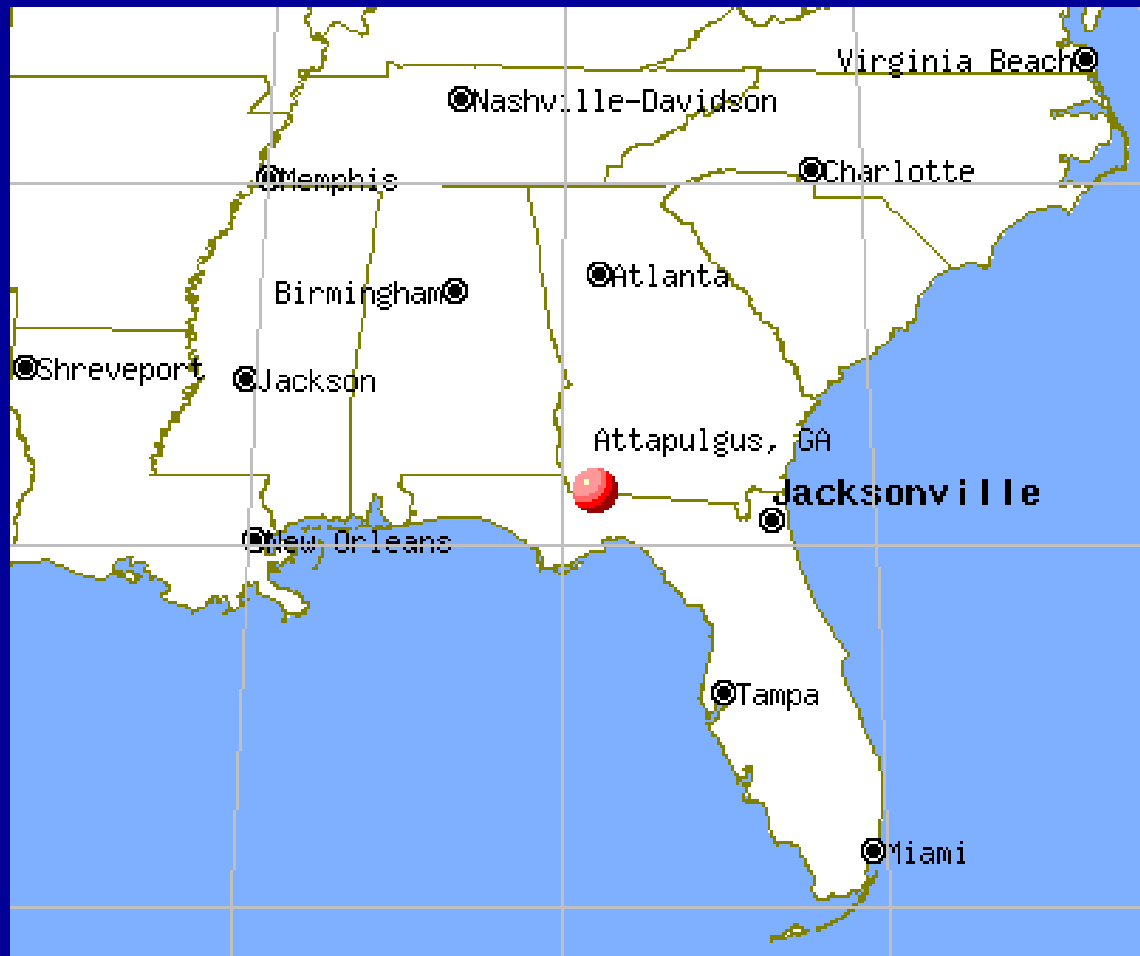
Tan
Susceptible lesion
Dillon



RB
Resistance lesion
Hyuuga



Attapulgu, GA



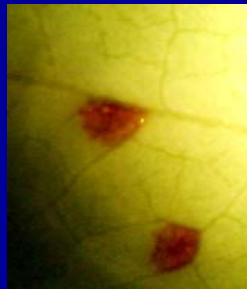
Dillon x Hyuuga Attapulcus, GA

- Planted 3 Sept 2005
- 117 RILs + 6 checks
- 2 reps in a RCBD
- -Natural and artificial infection
(6 Oct, 17 Oct, 24 Oct, 31 Oct,
9 Nov, 18 Nov)
- Rated 1 Dec 2005
- Evaluate 10 leaflets / row
- 10X magnification

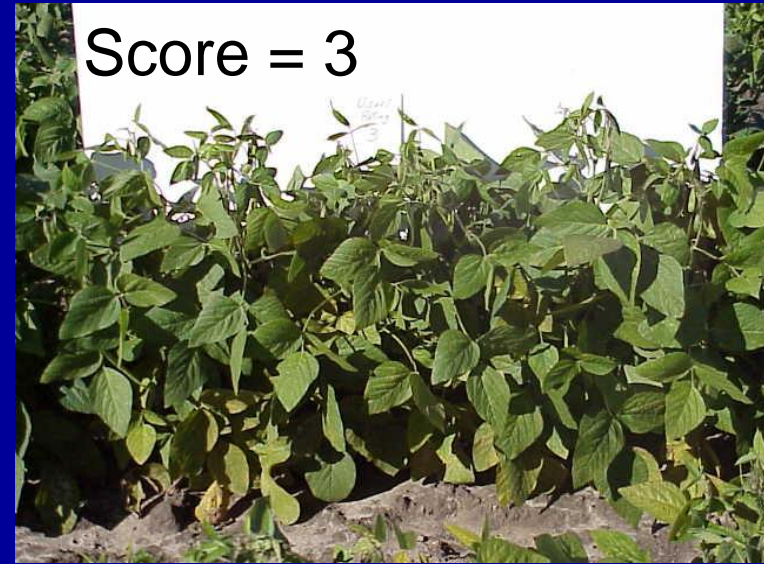
Dillon (S)



Hyuuga(R)



Dillon x Hyuuga Severity Scale



Dillon x Hyuuga Greenhouse Confirmation

- Feb-April 2006
- Evaluate 117 RILs
- 3 replications in RCBD
- Manual inoculation
- Humidity chamber

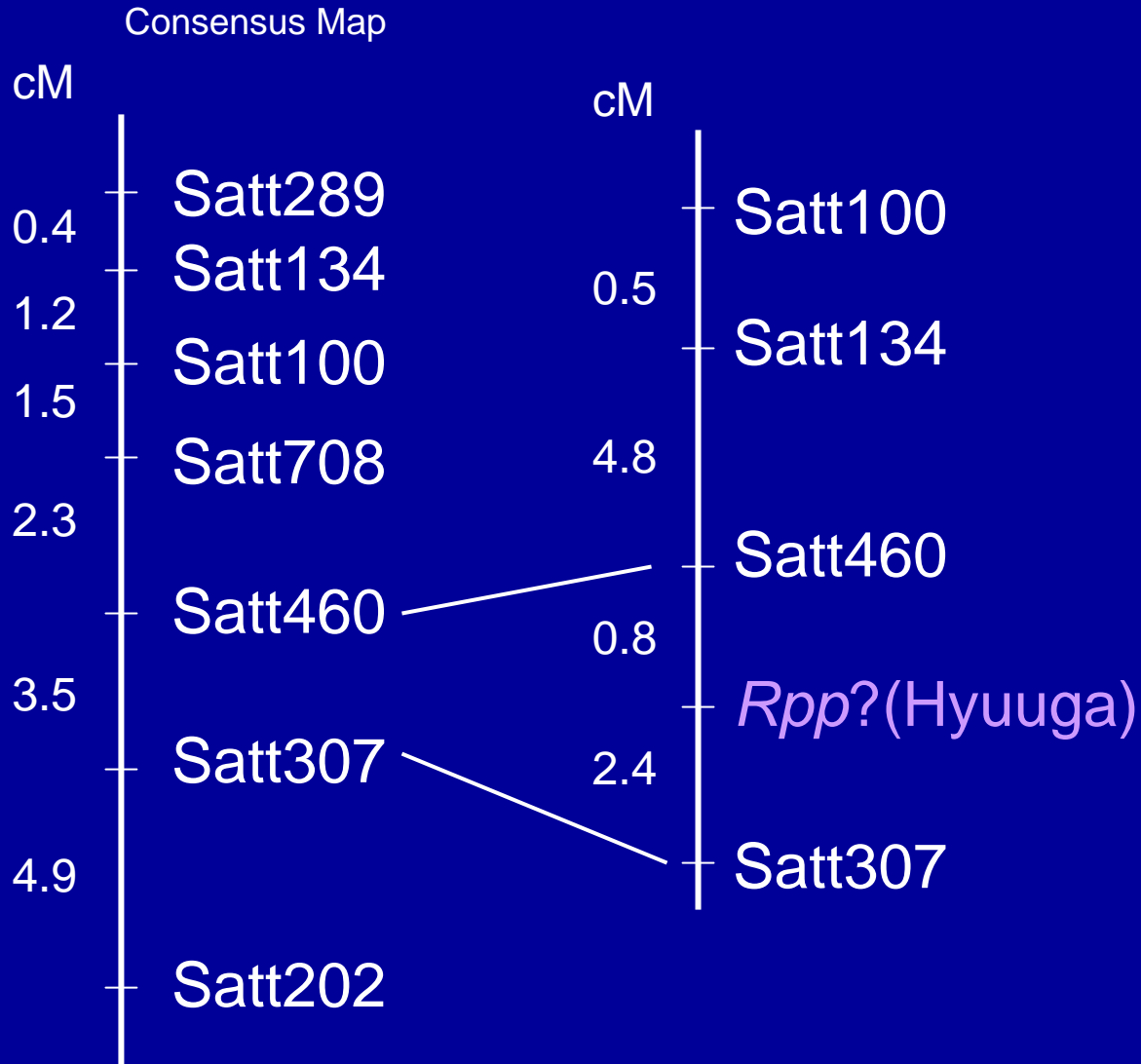


Dillon x Hyuuga Greenhouse Confirmation

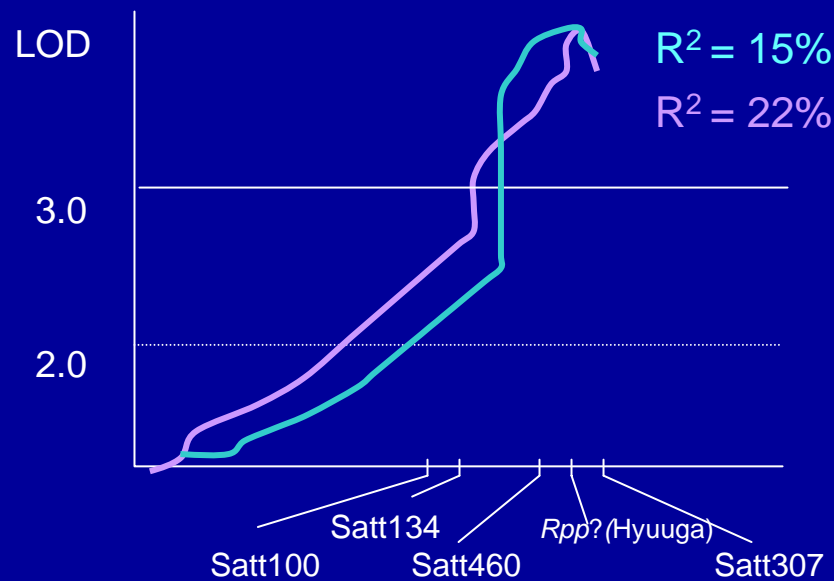
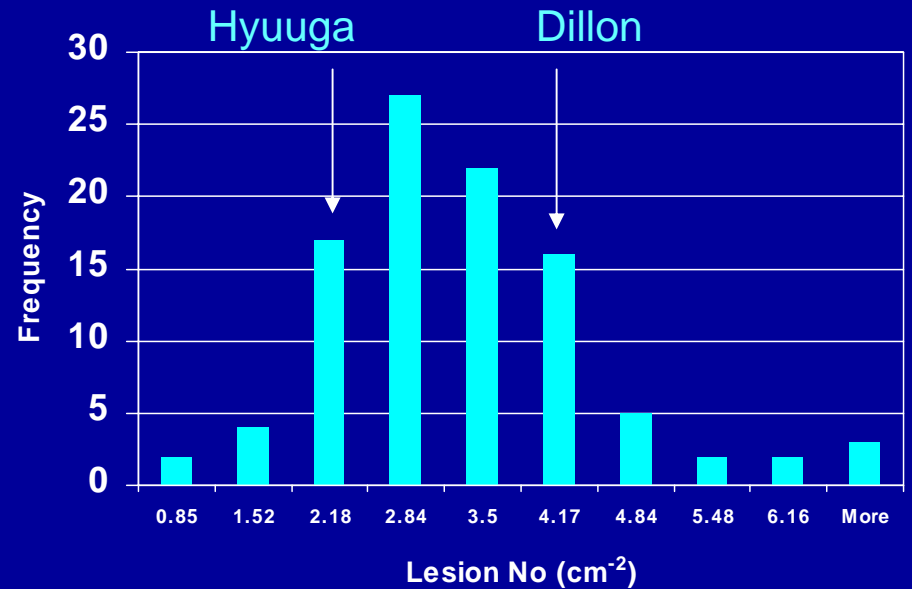
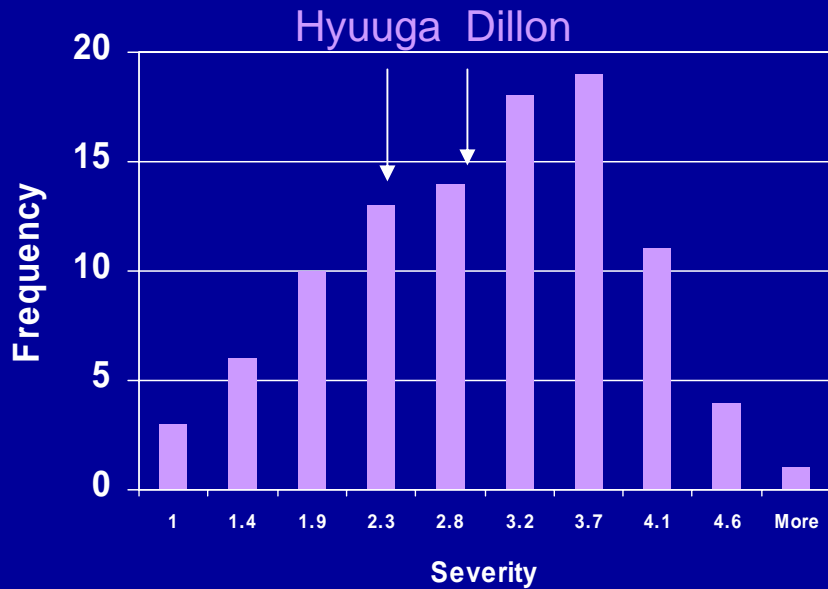
- Observations
 - using 2-3 leaflets
 - lesion type
 - number of lesions
 - sporulation



RB Lesion Type Maps to LG C2



QTL Mapping of Severity and No. of Lesions



Verification

Benning x Hyuuga



- Screen 92 $F_{5:6}$ lines with markers in 4 cM region on LG-C2
- Select 16 lines homozygous for each parental allele
- Planted 3 reps in a RCBD

Benning

Hyuuga



Tan

RB

Homozygous	Expect T:Mx:RB	Observed T:Mx:RB
Benning	16:0:0	15:1:0
Hyuuga	0:0:16	0:0:16

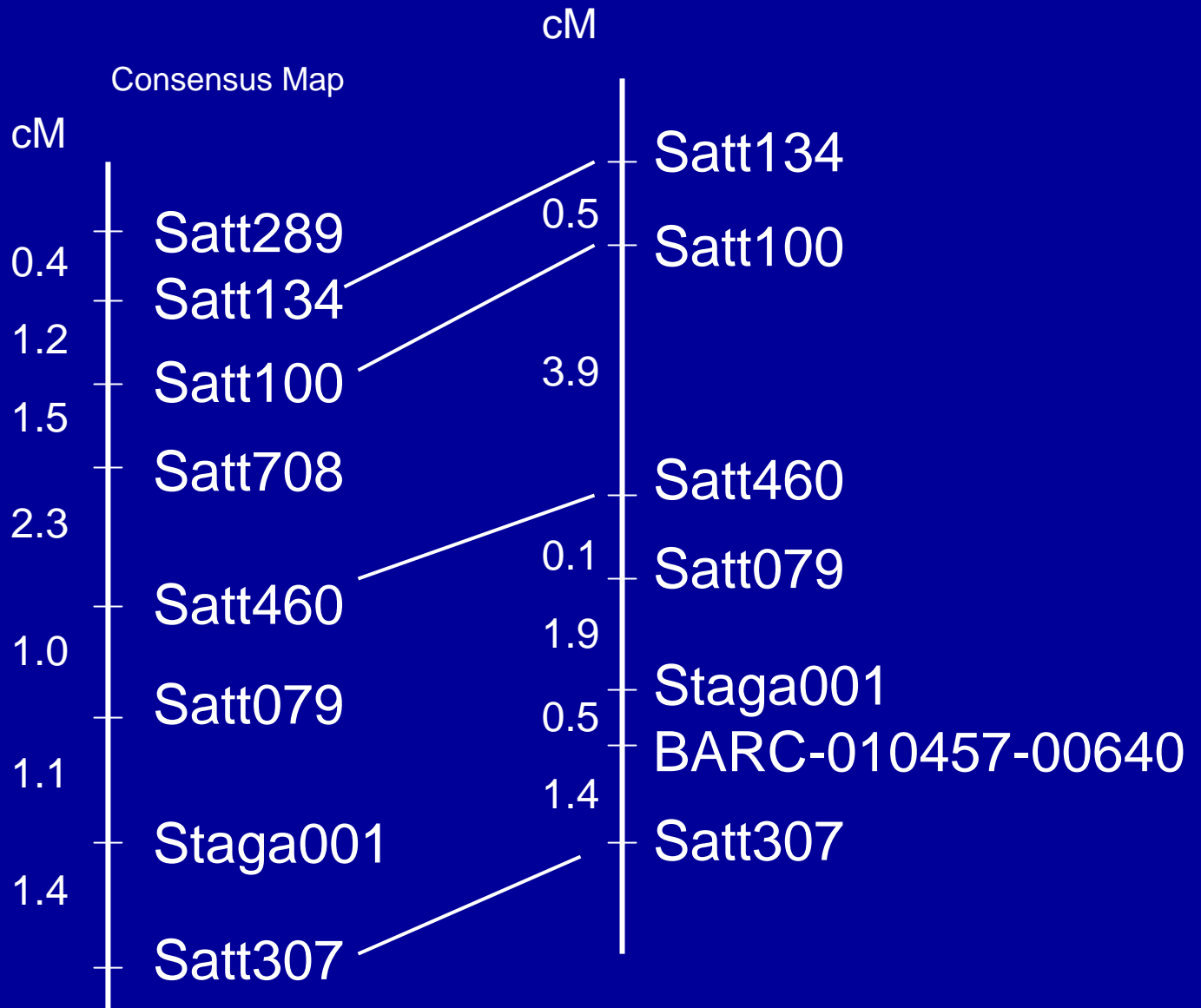
T = tan; M = mix; RB = red-brown

Benning x Hyuuga Lesion Type and Sporulation

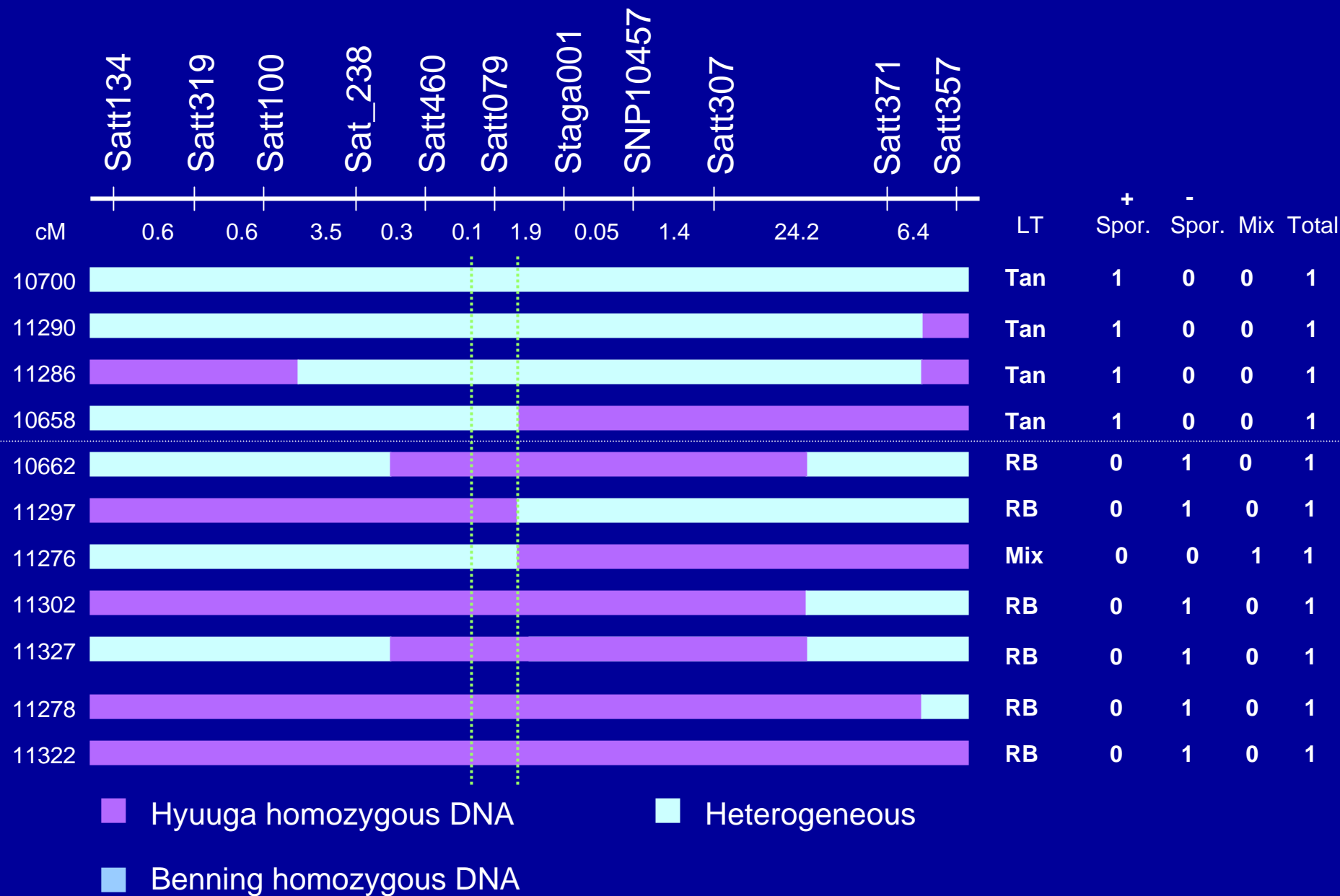
	Lesion No.		Sporulation	
	Mean [§] (cm ⁻²)	Range (cm ⁻²)	+	-
Benning	6.9 ^x	5.4 – 8.5	4	0
Hyuuga	2.5 ^y	1.5 – 4.5	0	4
Tan RILs	6.1 ^a	5.4 – 6.9	16	0 ^a
RB RILs	3.3 ^b	1.9 – 5.6	2	14 ^b

[§] Means followed by a different letter are different at $p = 0.05$.

Markers Close to *Rpp?Hyuuga* on LG-C2



Graphical Genotypes of Benning x Hyuuga



2006 Attapulgus Soybean Asian Rust Screening

- Planted 17 Aug 06
- (24-hour photoperiod from planting to 15 Sept 06)
- -Treated with agricultural grade streptomycin 10 times
- -Natural and artificial infection (5 Oct, 12 Oct, 19 Oct, 24 Oct, 31 Oct)
- Rated 16-17 Nov 06



Rust Incidence Ratings

- 2005 rating scheme
 - 5 = rust lesions in upper canopy
 - 4 = rust lesions in middle canopy
 - 3 = rust lesions in lower canopy
 - 2 = only a few lesions on lower canopy
 - 1 = no apparent rust lesions
- 2006 rating scheme
 - 5 = 4 or more leaves with many lesions
 - 4 = 1 to 3 leaves with many lesions
 - 3 = 4 or more leaves with a few lesions
 - 2 = 1 to 3 leaves with a few lesions
 - 1 = no apparent rust lesions

ASR Incidence 2005 (2006)

Cultivar	Mat Gp	ASR incidence	ASR lesion type
Dunbar	III	--- (4.3)	T
5601T	V	4.0 (4.7)	T
Dillon	VI	4.5 (3.0)	T
Musen	VI	4.5 (4.7)	T
Haskell	VII	5.0 (5.0)	T
Benning	VII	5.0 (5.0)	T

2006 Rust Incidence < 2.3 (25 of 45 accessions)

- MG I (3)
- MG II (1)
- MG III (1)
- MG V (1)
- MG VII (2)
- MG VIII (6)
- MG IX (11)
- No lesions (2)
- RB lesions (10)
 - RB w/o spores (4)
- Tan lesions (9)
- Mixed lesions (4)
- Russian Fed. (1)
- Japan (5)
- China (4)
- Vietnam (3)
- Indonesia (9)
- South Korea (1)
- Brazil (1)
- Moldova (1)

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