



VIỆN KHOA HỌC NÔNG NGHIỆP VIỆT NAM  
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**PHƯƠNG PHÁP BACKCROSSING  
GIẢI ĐỊNH-QUY TỤ NHANH CHÓNG  
CÁC TÍNH TRẠNG KINH TẾ VÀO  
MỘT GIỐNG**





# NỘI DUNG BÁO CÁO:

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**I. GIỚI THIỆU CHUNG**

**II. CHỌN GIỐNG NHỜ CHỈ THỊ PHÂN TỬ  
MAS-MABC**

**IV: PSEUDO-BACKCROSSING**

**V. KẾT LUẬN**

**VI. ĐỊNH HƯỚNG NGHIÊN CỨU**

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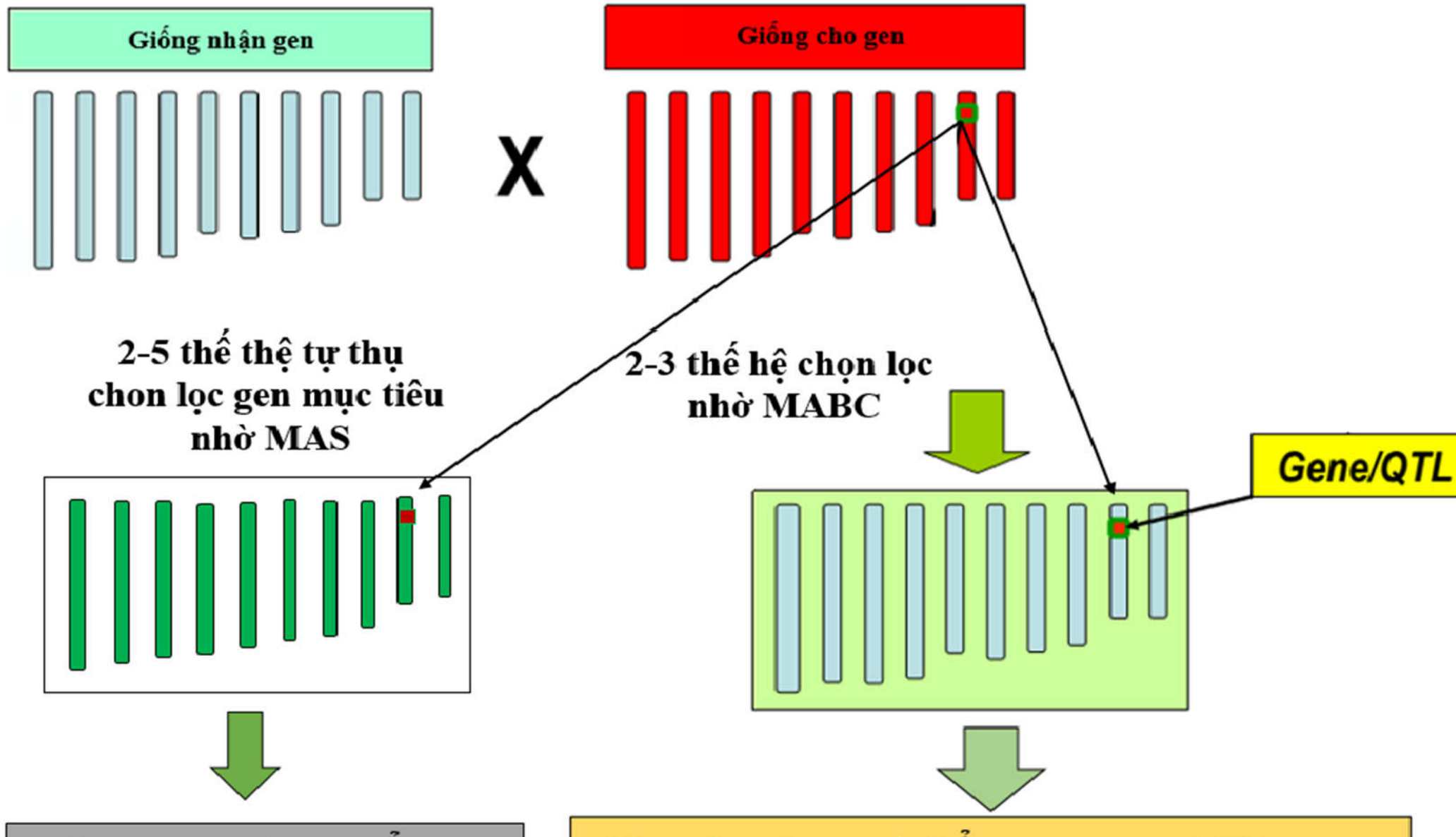
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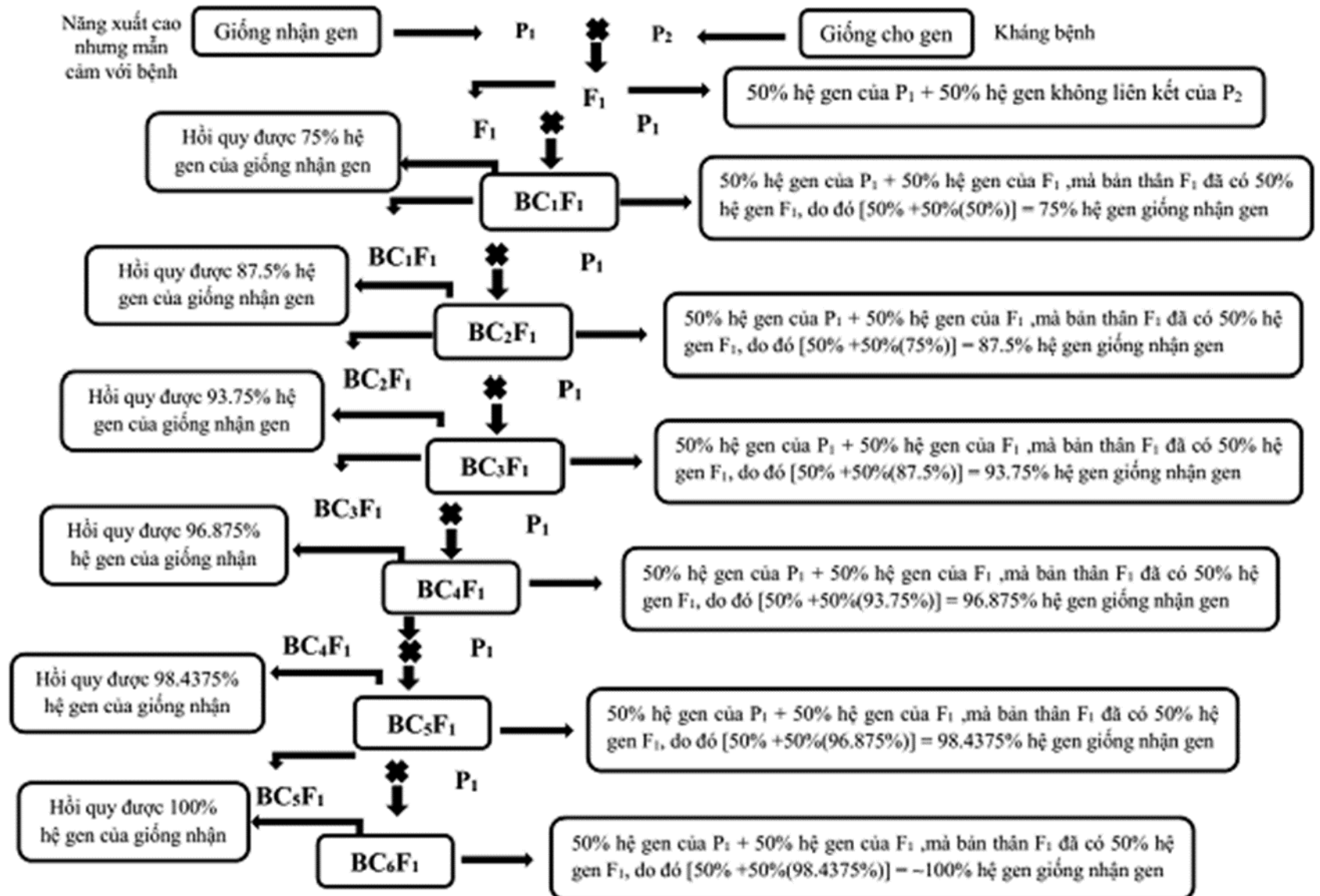


# CHỌN GIỐNG NHỜ CHỈ THỊ PHÂN TỬ





# BACKCROSSING

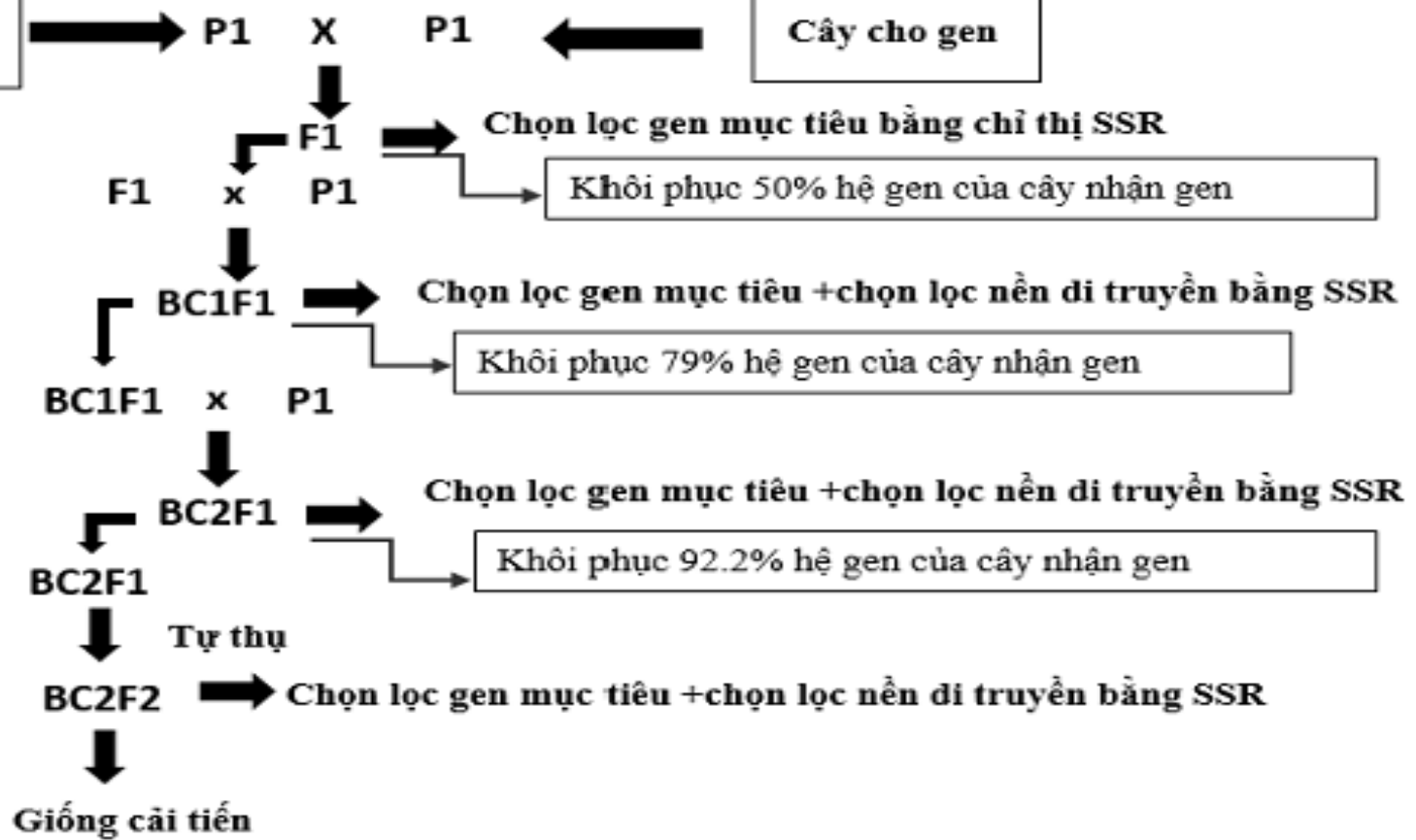


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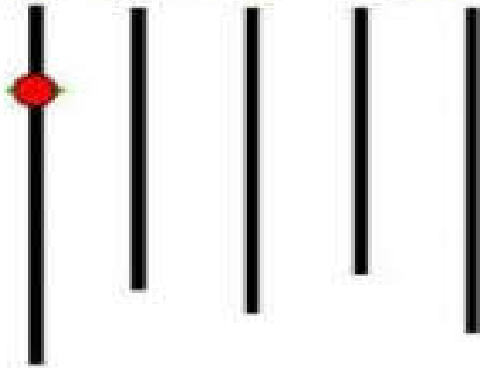
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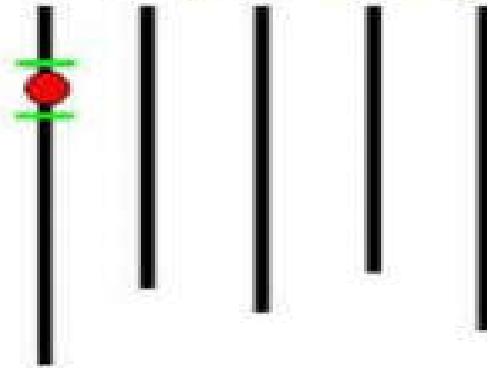


# CÁC BƯỚC CHỌN LỌC

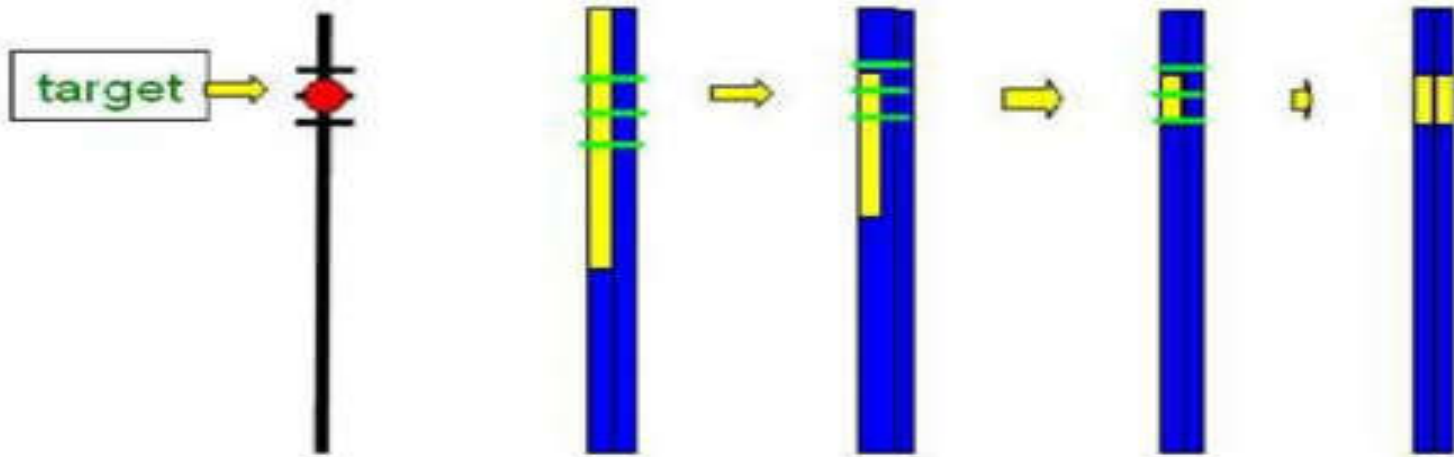
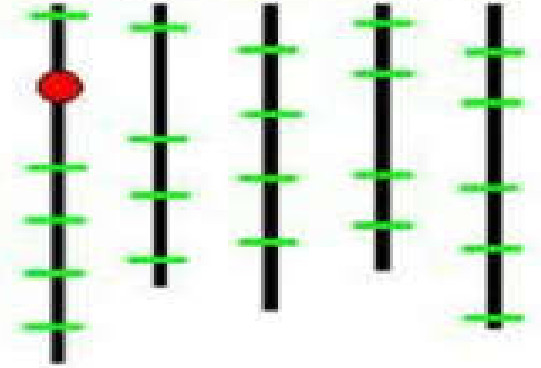
Chọn lọc locus mục tiêu



Chọn lọc tài tổ hợp

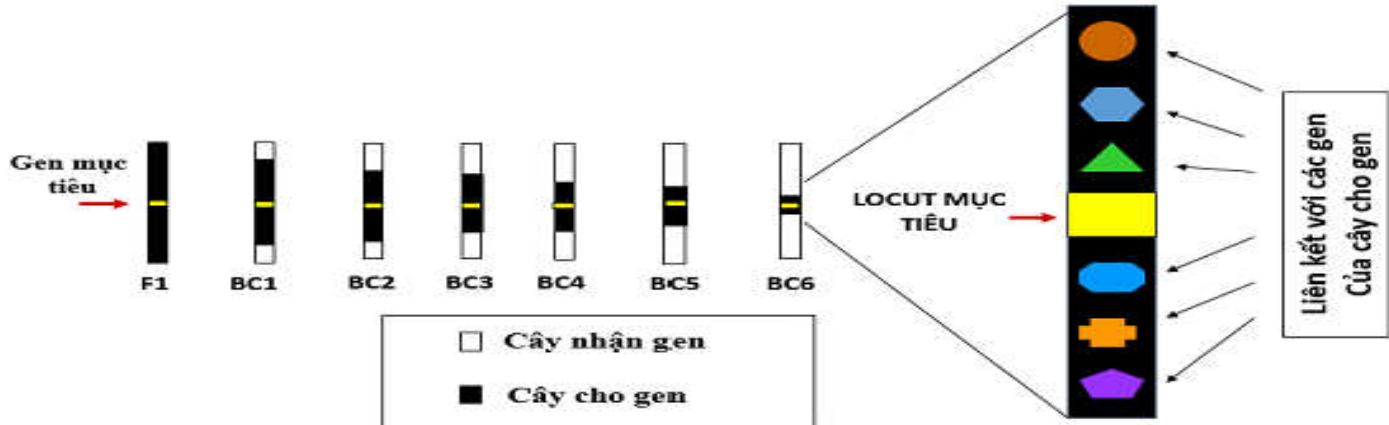


Lấy lại nền di truyền



### Khái niệm “liên kết kéo theo”

- Các gen không mong muốn bị chuyển vào với gen mục tiêu
- Các gen không mong muốn sẽ gây những ảnh hưởng tới một số tính trạng nông học

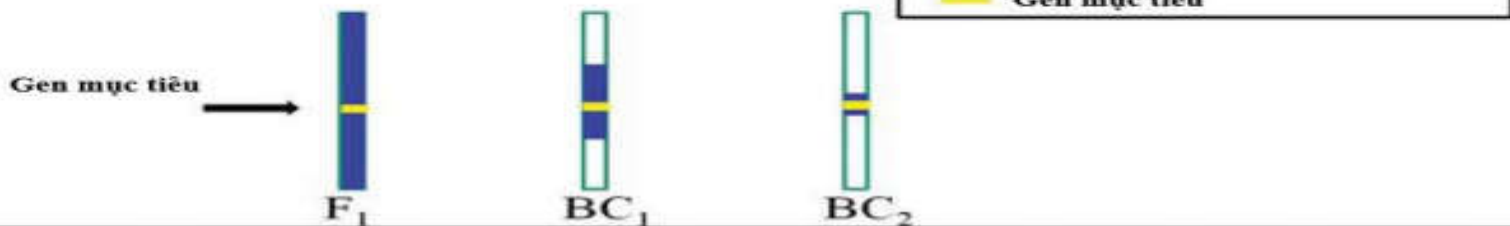


### Giảm thiểu liên kết kéo theo

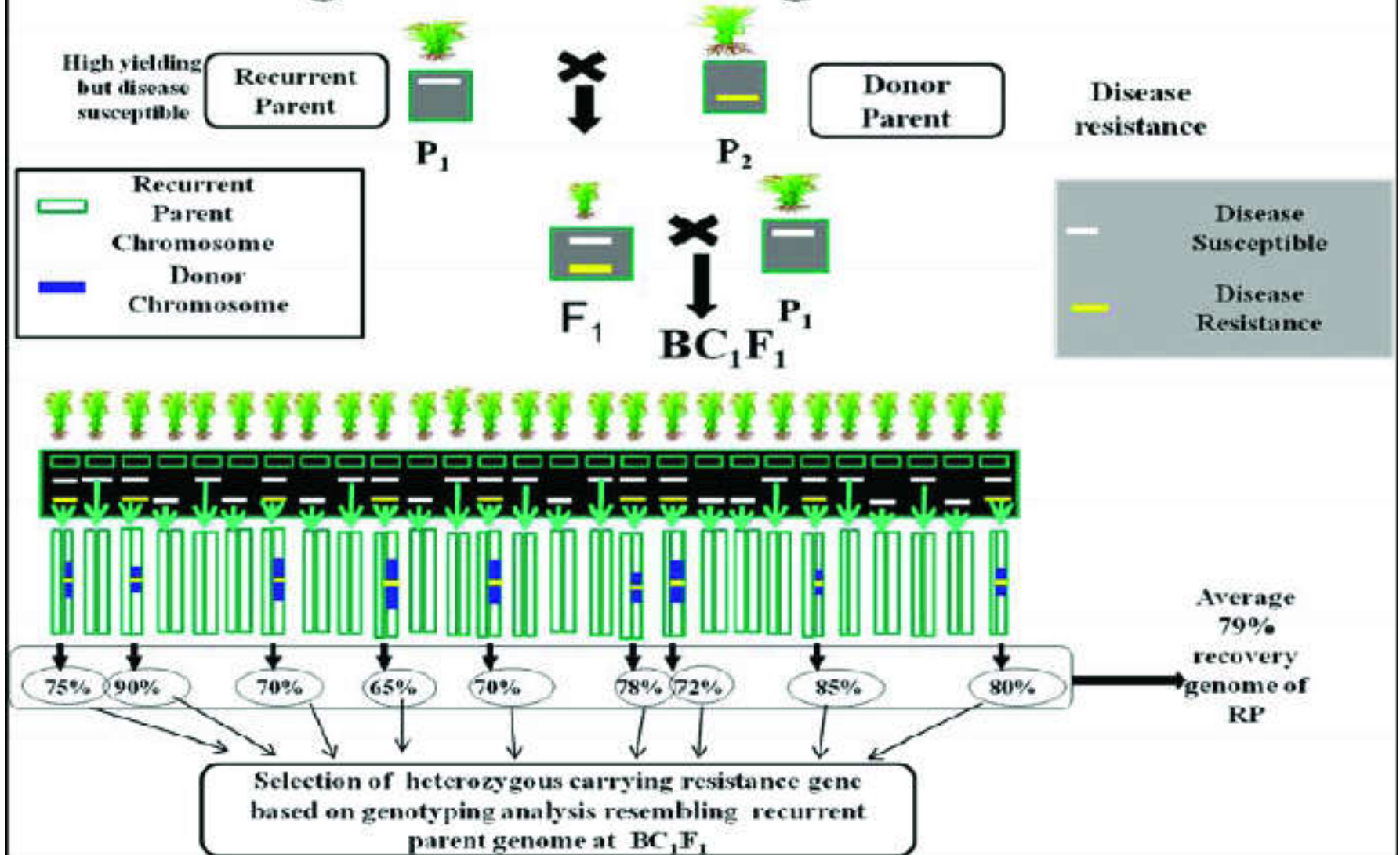
#### Phương pháp chọn giống truyền thống



#### Phương pháp MABC



# Foreground and Background selection



# Foreground and Background selection

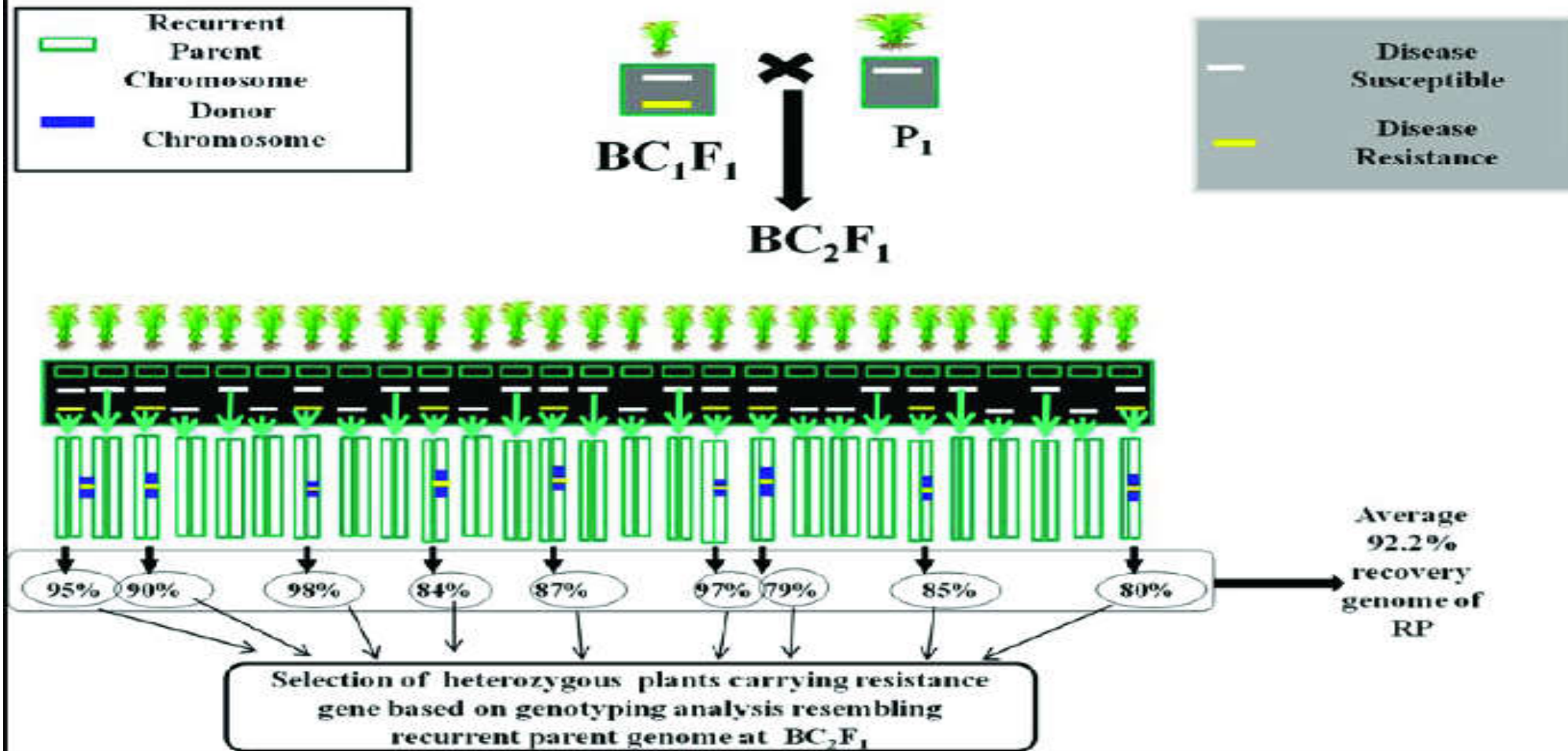
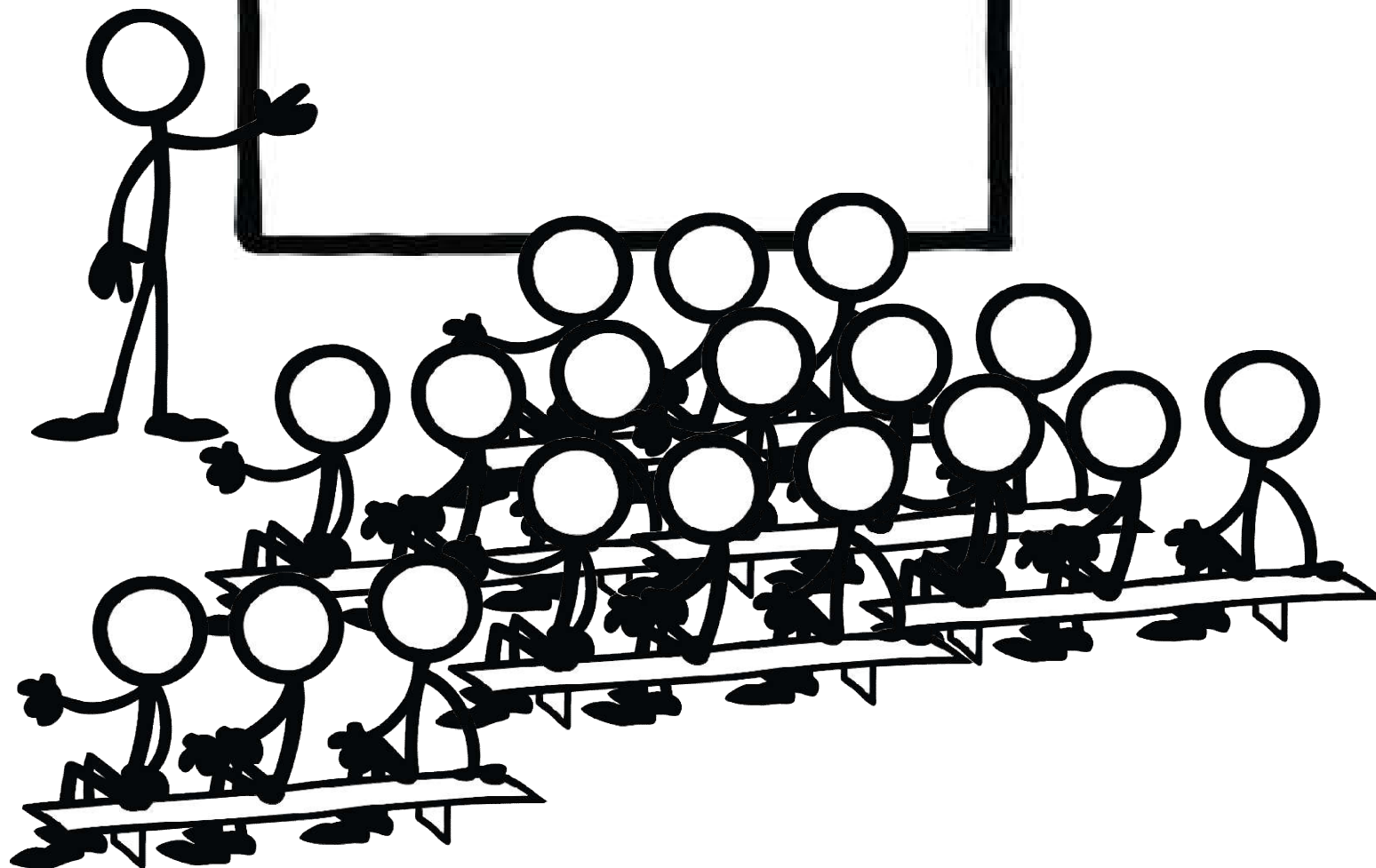


Table 2. Expected recovery of recurrent parent genome comparing conventional and marker assisted backcrossing in subsequent generations

Backcross generation	Number of individuals	% recurrent parent genome	
		Marker-assisted backcross	Conventional backcross
BC <sub>1</sub>	70	79.0	75.0
BC <sub>2</sub>	100	92.2	87.5
BC <sub>3</sub>	150	98.0	93.7
BC <sub>4</sub>	300	99.0	96.9

Source: Taken from Hospital [59] with permission from Wiley.

Pseudo-backcrossing:





## Pseudo-backcrossing:

- Được thực hiện ở một số cây lâu năm (Bouquet, 1986)
- Grape (Nho) (Molnar et al., 2007)
- Eucalyptus (Bạch đàn) (Kullan et al., 2012)
- Poplar (Bạch dương) (Novaes et al., 2009)
- Oil palm (Cọ dầu) (Montoya et al., 2014)
- Citrus (Cây có múi) (Ohta et al., 2014)

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Flint corn (Ngô đá) ( Barcaccia và cs 2006)

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Rice (Lúa) (Siriphat et al., 2015 [Rice \(N Y\)](#). 2015; 8: 7.) (Das & R 2015-[Front Plant Sci](#). 2015; 6: 698.)

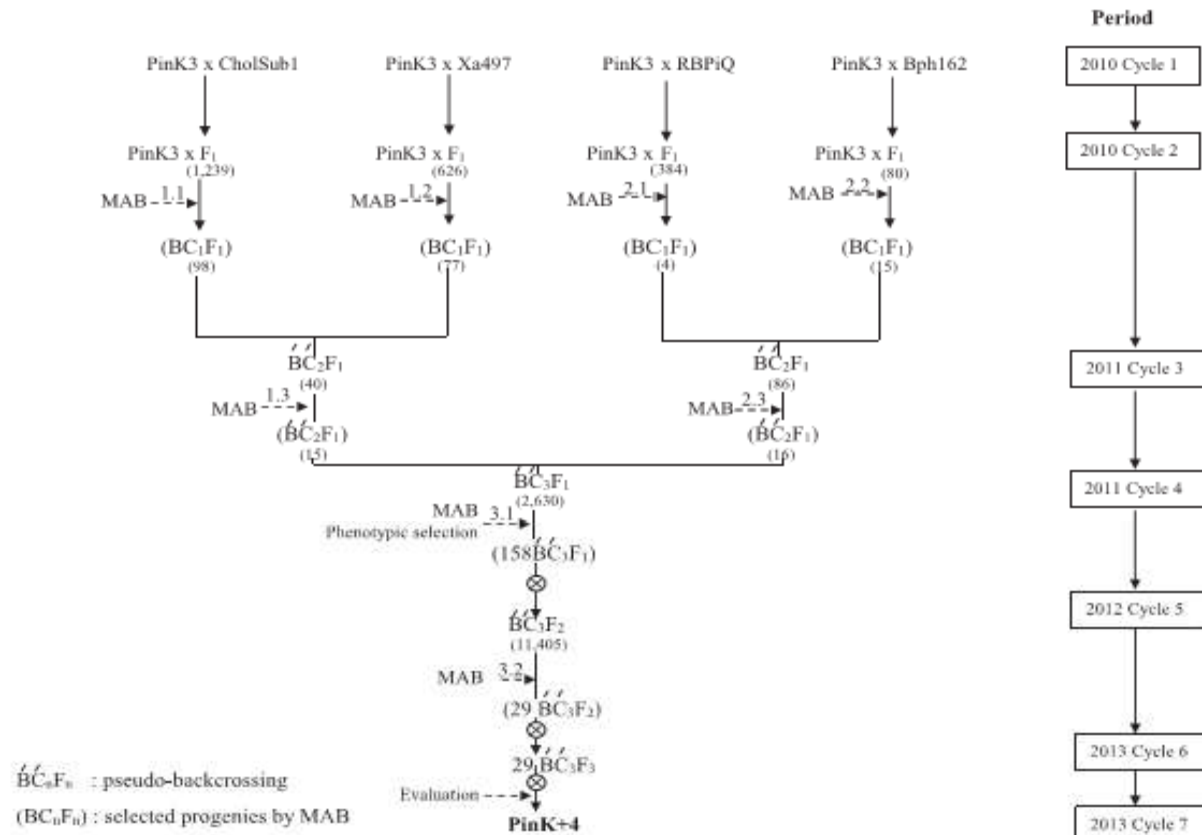
**Table 1 The four donors and recurrent parents used in the multiple backcross gene pyramiding**

Cultivar/breeding line	Description	Variety type	Cross	Genotype on carrier chromosomes and target gene (s) or QTLs											References	
				<i>Sub</i>	<i>xa5</i>	<i>Xa21</i>	qBL1	qBL11	Bph3	<i>TPS</i>	<i>Wx</i>	<i>SSIIa</i>	<i>Os2AP</i>	<i>Hd1</i>		
Pink3	High yielding aromatic rice (pseudo-recurrent parent)	RIL	IR71501/(KDMI105/CT9993)	-	-	-	-	-	-	+	-	+	-	+	+	Rice Science Center (unpublish)
CholSub1	Submergence tolerance aromatic rice with high GT	RIL	IR57514/KDMI105	+	-	-	-	-	-	-	-	-	+	+	+	Jantaboon et al. 2011
Xa497	BLB resistance aromatic rice	BC <sub>2</sub> F <sub>2</sub>	IR62266/KDMI105	-	+	+	-	-	-	-	-	-	-	+	+	Korinsak 2009
RBPIQ	Blast resistance	RIL	JHN/KDMI105	-	-	-	+	+	-	-	-	-	-	-	+	Rice Science Center (unpublish)
Bph162	Bph resistance photosensitive rice	BC <sub>3</sub> F <sub>6</sub>	Rathu Heenati/KDMI105	-	-	-	-	-	-	+	+	-	-	-	-	Jairin et al. 2009

+ = desirable allele.

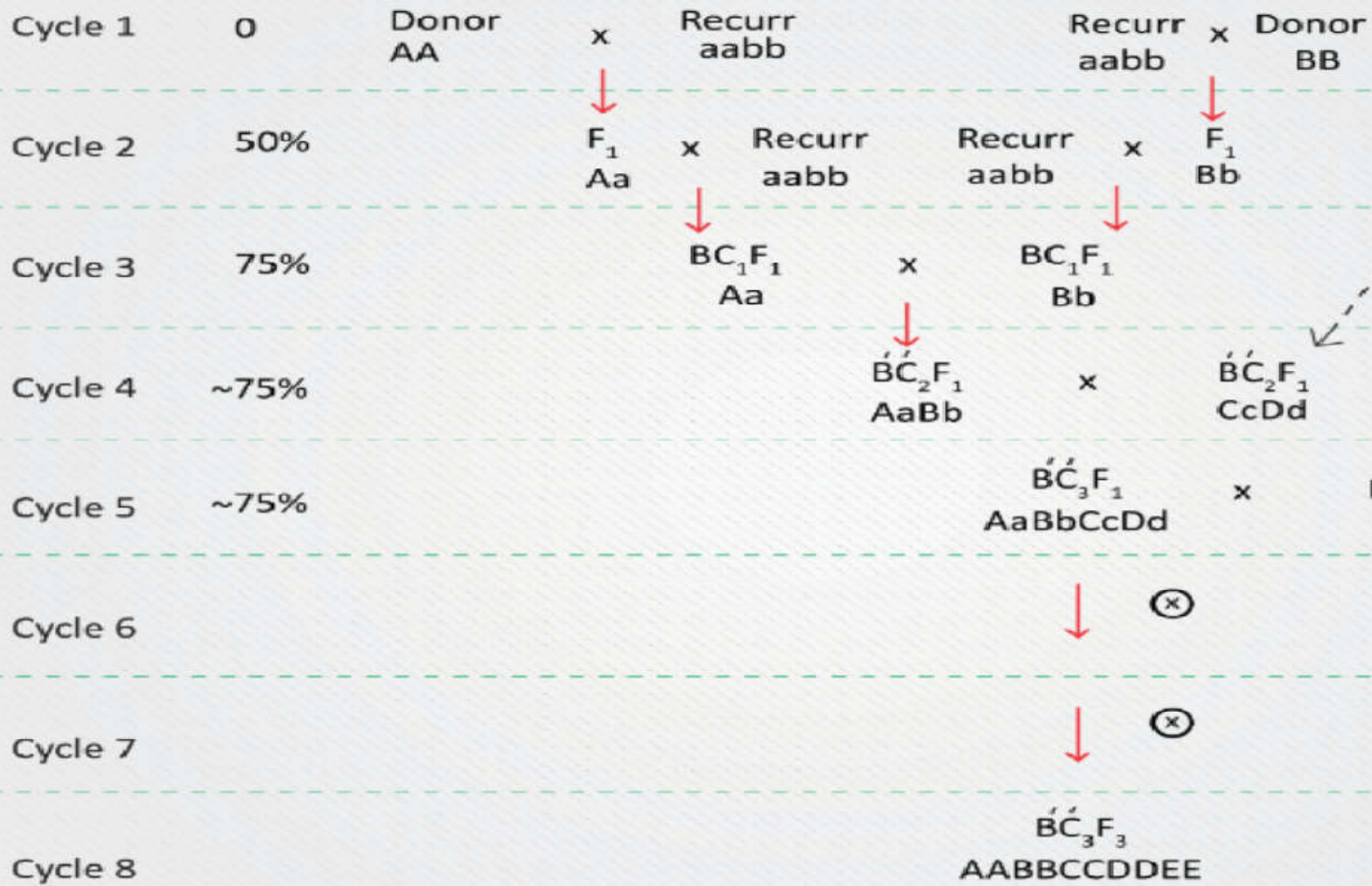
- = undesirable allele.

# Pseudo-backcrossing:

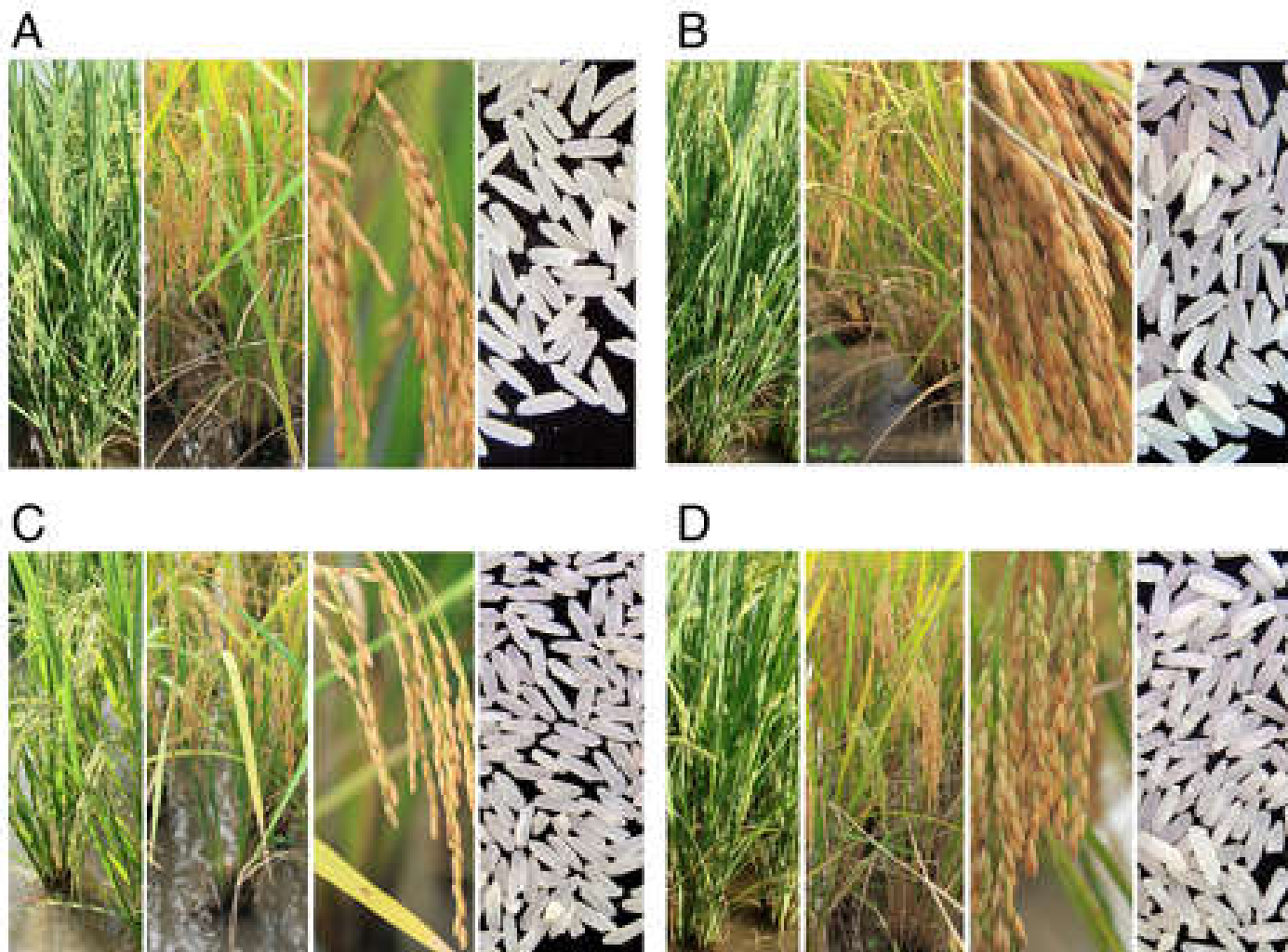


**Figure 1** The gene/QTL pyramiding scheme used to generate the high-yield pseudo-BC BIL'PinK + 4' line exhibiting submergence tolerance (*Sub1A-C*), bacterial leaf blight resistance (*Xa21*, *xa5*), rice blast resistance (*qBL1* and *qBL11*), brown planthopper resistance (*qBph3* and *TPS*) and desired cooking qualities (*Wx*, *SSIIa*, *Os2AP*).

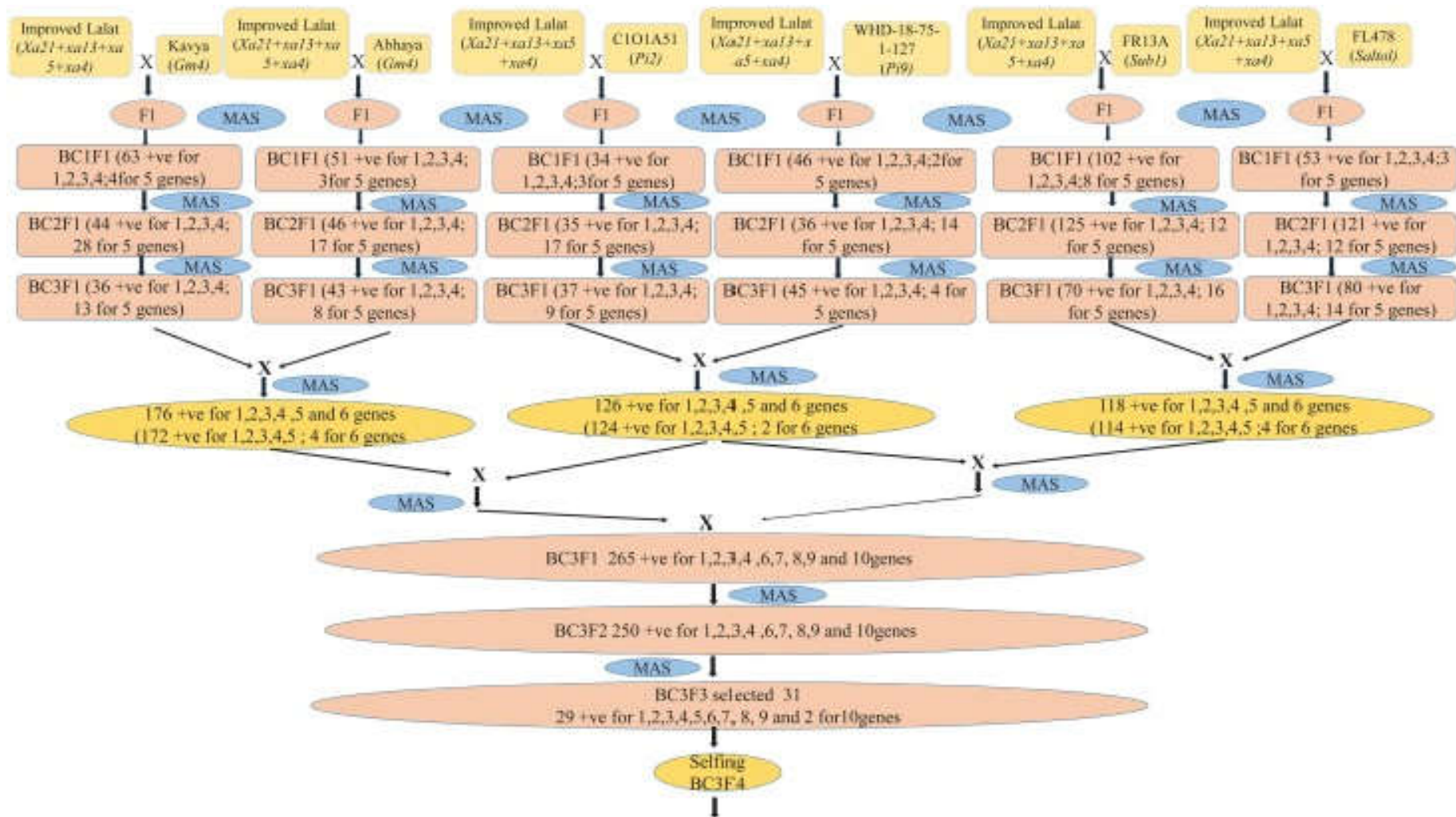
# Pseudo-backcrossing:



↑ Marker-assisted Backcross  
 Pseudo Backcross  
 Pedigree Selection  
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**Figure 2** Plant and grain types of pseudo-BC BIL PinK + 4 compared with PinK3 (pseudo-recurrent parent). A) PinK + 4#1E06, B) PinK + 4#20A09, C) PinK + 4#66B09 and D) PinK3.



Das G, Rao GJN. Molecular marker assisted gene stacking for biotic and abiotic stress resistance genes in an elite rice cultivar. *Frontiers in Plant Science*. 2015;6:698. doi:10.3389/fpls.2015.00698.

# KẾT LUẬN

PHƯƠNG PHÁP PSEUDO-BACKCROSSING: LÀ PHƯƠNG PHÁP HIỆU QUẢ QUY TỤ NHIỀU QTL/GEN KINH TẾ VÀO MỘT GIỐNG, TRONG THỜI GIAN NGẮN;

KẾT HỢP LAI KÉP CỦA CÁC TỔ HỢP BACROSS MANG GEN CẦN CHUYỂN

SÀNG LỌC MAS/MABC

# ĐỊNH HƯỚNG NGHIÊN CỨU

HƯỚNG MỞI CÓ THỂ QUY TỤ NHIỀU TÍNH CHỐNG  
CHỊU SINH HỌC VÀ PHI SINH HỌC VÀO MỘT GIỐNG  
CÁC QTL/GEN CHUYỂN CÓ BIỂU HIỆN TRONG ĐIỀU  
KIỆN TỰ NHIÊN?

TƯƠNG TÁC GIỮA CÁC QTL/GEN