

**Table S3** Transition matrix for two loci in the generation of two-way RIL by selfing

$g_k$	$g_{k+1}$				
	$AA AA$	$AB AB$	$AA AB$	$AA BB$	$AB BA$
$AA AA$	1	0	0	0	0
$AB AB$	0	1	0	0	0
$AA AB$	1/4	1/4	1/2	0	0
$AA BB$	$(1-r)^2/2$	$r^2/2$	$2r(1-r)$	$(1-r)^2/2$	$r^2/2$
$AB BA$	$r^2/2$	$(1-r)^2/2$	$2r(1-r)$	$r^2/2$	$(1-r)^2/2$