Negative evidence of the transmission of the cytoplasmic male sterility in wheat by embryo-endosperm grafting

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Investigations carried out by FRANKEL (1956, 1962) and Edwardson and Corbett (1961) in *Petunia*, which demonstrated the asexual transmission of cytoplasmic male sterility by grafting, as well as the negative results obtained by Sand (1960) working with *Nicotiana*, induced to the present author to test the possible asexual transmission of the cytoplasmic male sterility in wheat. The material used (supplied by Dr. R. W. LIVERS, Hays, Kansas, U. S. A.) was as follows : line B (normal fertile) Bison wheat C. I. 12518 ; line A (cytoplasmic male sterile) : *T. timopheevi* x $Bison_{10}$; line R (fertility restorer) : (*T. timopheevi* x Marquis 3) x Bison F_4. Investigation was made by grafting embryos of male sterile plants (A) on endosperms of fertile plants (B) and, reciprocally, B embryos on A endosperms.

Selfings and crosses showed the following results: Results of Table 1 show that neither cytoplasmic male sterility nor fertility are asexually transmitted by embryo-endosperm grafting (plants BA and AB respectively).

Tables 2 b and 2 c indicate that crossability of male sterile with maintainer lines is not modified by the graft. Progeny obtained from the crossings indicated in Tables 2a, 2b and 2c will be tested the next generation in order to verify whether or not the fertility restoring mechanism has been modified.

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Table 1. Selfings

Plant	Number of ears selfed	Number of seeds obtained	Remarks
AB – 1	3	0	
AB – 2	3	0	
AB – 3	3	0	
AB – 4	2	0	
AA – 1	2	0	
BA – 1	2	27 + 31	
BA – 2	2	23 + 26	
BA – 3	2	25 + 31	
BA – 4	2	32 + 21	
BA – 6	1	22	
BA – 7	3	27+18+30	
BB – 1	2	42	Without bagging
BB – 2	2	46	

Plant AB: Embryo A on endosperm B
〃 AA: 〃 A 〃 〃 A
〃 BA: 〃 B 〃 〃 A
〃 BB: 〃 B 〃 〃 B

Table 2. Crossings

a)

♀ \ ♂	BB-1		BB-2		R	
BA-1	20	16	20	12	20	19
BA-2	20	16	20	18	20	13
BA-3	20	19	20	18	20	18
BA-4	20	0	20	15	20	20
BA-6	20	15	20	20	20	17
BA-7	40	18	20	19	20	18
Total	140	84	120	102	120	105
	p.f.	s.o.	p.f.	s.o.	p.f.	s.o.

b)

♀ \ ♂	BB-1		BB-2		R	
AB-1	20	17	20	5	20	10
AB-2	20	9	20	10	20	18
AB-3	20	14	20	16	20	20
Total	60	40	60	31	60	48
	p.f.	s.o.	p.f.	s.o.	p.f.	s.o.

p.f. : Number of pollinated florets
s.o. : Number of seeds obtained

c)

♀ \ ♂	BB-1	BB-2	BA-1	BA-2	BA-3	BA-4	BA-7	R	
AA	20	20	20	20	20	20	20	20	pollinated florets
	11	19	18	20	16	20	20	8	seeds obtained