

Frequencies of androgenetic monoploids and diploids obtained
in matings of three inbreds as male to W23 ig ig females

Pollen parent	Population	Androgenetic derivatives		
		Monoploid	Diploid	Frequency (x 10 ⁻³)
WA374	3369	59	11	20.8
W23R	2304	28	3	13.5
A632	3583	49	1	14.0
	9256	136	15	16.3

insight into the mechanisms of androgenesis and chromosome doubling is needed in order to discover whether this relationship is other than fortuitous.

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2. Androgenesis and the indeterminate gametophyte mutation: Source of the cytoplasm.

Texas cytosterility is being used as a marker to identify maternal or paternal origin of the cytoplasm in the event of ig associated androgenesis. From T x N crosses, androgenetic plants were established from inbreds WA374, W23R, and A632 and then backcrossed to pollen parents of the respective inbred. Offspring from the backcrosses, consisting of 202 individuals descended from 44 monoploids and 73 descended from 3 diploids, were observed for pollen fertility in 1972.

All 202 were male sterile.

If sterility results from derivation of cytoplasm from the maternal parent, then descendants of andronotes obtained through N x N matings should be fertile. Such cases also serve as a control over the possibility that the observed sterility resulted not from inheritance of T-cytoplasm but as some consequence of the androgenetic event itself.

Observations on 71 first-generation descendants of 7 andronotes of N x N ancestry argue against a trivial basis for the male sterility which

Male fertility of the first generation offspring of andronotes

Cytoplasm of W23 <u>ig ig</u> +	Pollen parent	Andronotes		Number of offspring		
		<u>Monoploid</u> or <u>Diploid</u>	Cases	Sterile	Partially sterile	Fertile
T-sterile	WA374	M	14	29	0	0
		D	1	1	0	0
T-sterile	W23R	M	6	8	0	0
		D	1	23	0	0
T-sterile	A632	M	24	165	0	0
		D	1	49	0	0
Fertile	WA374	M	1	0	0	1
		D	1	0	0	25
Fertile	W23R	M	2	0	0	2
		D	1	0	0	23
Fertile	A632	M	2	1	1	28
		D	0	0	0	0

characterized the material of T x N extraction. All but two plants, one completely sterile and the other partially so, were scored as fertile. The sterile plant was morphologically atypical relative to the inbred involved. Both exceptions proved partially female sterile, furthermore, indicating the male sterility had a basis other than that observed in the T x N series.

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3. Nucleo-cytoplasmic interaction in the determination of a defective seed trait.

A strain whose maternal lineage traces to Euchlaena perennis through six successive crosses to maize was furnished by J. B. Beckett. The early parentage is complex, including a backcross of the hybrid with a stock of elongate; the final two crosses were with inbred W23. Second backcrosses with W23, made in 1971, gave an unexpected outcome. All of