

pollination should be delayed for two minutes or longer.

Table 2
Seed sets from sequential pollinations

Time sec	Sliding average of five ears			Ratio B+C/D+E
	A	B+C	D+E	
			39	4
30	80	169	38	4
60	75	167	37	3
90	57	115	26	4
120	73	112	16	7
150	48	109	8	9
180	48	76	6	12
210		72	5	14
240		77	4	25
270		93	4	22
300		82	4	17
330		57	3	17
360		50	3	19
390		44	2	20
420		39	2	19
450		45	2	19
480		39	2	21
510		37	2	22
540		33	2	
570		40		
600		50		

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1. Multiple aleurone layering in maize.

The aleurone layer of corn comprises from 1 to 2 percent of the corn kernel. It contains about 20 percent protein with a large proportion of the amino acids being of the basic type and therefore valuable nutritionally. Unfortunately, less than 5 percent of the kernel protein is found in the aleurone layer. Normally the aleurone layer is made up of

Table 1

Progeny performance for single and double aleurone selections from recurrent selection series A100C.
Grown near Homestead, Florida in the winter of 1967-1968.

67-68 W Row No.	Pedigree	Parental Aleurone Composition	No. Ears	No, Kernels Examined	Progeny Aleurone Layer Composition				
					Single	Partly Double	Double	Partly Multiple	Percent Kernels With More Than 1 Layer
731	793 ⊗	Single 100%	8	37	37	-	-	-	0
732	794 ⊗	Segregating	5	26	5	10	10	-	81
733	795 Seg ⊗	Segregating	8	37	15	8	8	6	59
734	795 Seg ⊗	Segregating	10	53	19	14	6	10	64
				CROSSES					
735	(795) x (793)	(Seg) x (Single)	10	49	28	7	7	7	43
736	(793) x (795)	(Single) x (Seg)	9	45	24	13	6	2	47
737	(795) x (687)	(Seg) x (Single)	10	50	17	8	25	-	66
738	(687) x (795)	(Single) x (Seg)	10	50	42	7	1	-	16

a single layer of cells at the periphery of the endosperm. Doubling the aleurone layer would increase the protein from this source.

From a recurrent selection study for high-amylose starch involving exotic strains into which the ae gene (amylose extender) had been introduced, several selections with high-amylose content and high-protein and several with high-amylose and low protein were found. While examining these selections microscopically for starch and protein characteristics, kernels with double-aleurone layers were found.

A summary of the aleurone composition for the parents and their progenies is given in Table 1. Reciprocal crosses between single and double aleurone layered selections indicate the double-aleurone layer character is dominant. Of additional interest is that some kernels with multiple aleurone layers were also found.

We assumed the source of the multiple aleurone layer characteristic was from the exotic strains. We, therefore, obtained as many of the exotics used in the recurrent selection study as possible. Among these, Peruvian 442 was found to have about 35% of its kernels with more than one layer of aleurone.

Inheritance studies of the multiple aleurone layer characteristic are in progress and we also plan to make comparative biological evaluations of the protein from single, double and multiple aleurone layered selections.

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2. Tetraploid gene segregation as studied with a repulsion phase marking system.

This system enables one to investigate the many factors which complicate tetraploid gene segregation such as double reduction, numerical non-disjunction, and the viabilities of aneuploid gametes and zygotes. The understanding of these factors is necessary to explain the partial sterility of most autotetraploids.

The system may be described as the following of two genes at the same time in the repulsion phase--each chromosome is marked with a dominant and a recessive gene. For example, plants with the genotypes of