1. A method for doubling the number of chromosomes in monoploid corn plants.

A total of 119 monoploid plants of 18 different seed stocks were treated with aqueous solutions of colchicine. The concentrations of colchicine varied from 0.025 per cent to 0.25 per cent. The length of time of treatment with colchicine ranged from 3 to 40 hours. Colchicine treatments were applied by placing all roots of monoploid plants in 300 ml. of aqueous solutions of colchicine.

Reactions of the monoploid seedlings to colchicine treatments varied from slight swelling of the root tips and scutellar nodes to killing of the seedlings. Diploid tassel sectors were observed in many of the treated monoploid plants. Variation in the extent of these diploid sectors include single anthers, single florets, numerous florets, and complete tassel branches.

The effects of two different treatments on self-fertility of monoploid plants are shown in the following table. For each colchicine treatment a number of treated plants are compared with untreated plants from a similar seed stock. Both colchicine treatments significantly increased the per cent of self-fertile plants.

	.05% Colchicine for 24 Hours		
	Number Progeny	Plants With Diploid Tassel Sectors	Per Cent Self-Fertile Plants
Treated	18	11	67%
Untreated	11	3	18%

	.05% Colchicine at 24 Hours in Colchicine, 24 Hours in Nutrient Solution, 24 Hours in Colchicine		
Treated	30	16	40%
Untreated	23	6	8.7%

In using the described method of treatment, a concentration of 0.05 per cent colchicine was most desirable from the standpoint of seedling reaction and doubling of chromosome number. Higher concentrations often caused severe injury or death of the monoploid seedling, even when the length of time of treatment was considerably shortened.

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