Acknowledgments.—I am indebted to Professor E. B. Ford, F.R.S., Mr W. H. Dowdeswell and Dr E. R. Creed for their interest in the work described and for valuable discussions; and to Professor J. L. Jinks for suggesting the application of variance-ratio methods.

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FREQUENCIES OF HAPLOIDS IN SPRING OIL-SEED RAPE (*BRASSICA NAPUS*)

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Received 18.xi.68

Haploids from the genus Brassica were reported first by Morinaga and Fukushima (1933) in the species *B. napella,* which Olsson (1954) has since shown to be in all respects identical to *B. napus.* These haploids were highly sterile and occurred fairly frequently in rape fields. Morinaga stated that " Half a day's excursion through the rape field, when the flowers are passing away, will suffice to find dozens of such haploid individuals ". In Sweden Olsson and Hagberg (1955) found seven haploids in winter varieties of oil-seed rape over a four year period, but the frequency of haploids was low. Only three haploids were obtained from a 6000 square metre (about 1½ acre) propagation field of the Svalöf variety Matador after " careful and thorough investigation ". These marked differences in frequency of haploids may have been determined either by environmental or by genetical factors.

In 1967 haploids were recognised at flowering time in plots of four spring varieties of oil-seed rape, *B. napus* L. ssp. *oleifera* (Metzg) at Cambridge. They were easily identified by their small, pollen-sterile flowers and very poor seed set; the stomatal guard cells from the underside of leaves from these plants were also shorter than those from diploids. Estimates of plant populations were made from counting the number of plants in 40-ft lengths of rows from two plots of each variety (all plants were counted in the small plot of the Canadian variety, Target). A much higher frequency of haploids occurred in Target than in the considerably larger populations of the other three varieties of European origin (table 1).

These stocks, with the addition of the Canadian varieties, Nugget and Tanka as well as the French variety, Cresus, were grown in 1968 and examined for haploids, the majority of haploids being recognised before the flowers opened from the appearance of the inflorescence head with the small, slim, fairly erect flower buds. Haploids were from ten to twenty times more frequent in Canadian than in European varieties (table 2).

TABLE 1

Frequency of haploids in spring varieties of oil-seed rape in 1967

Variety	Number of haploids	Total number of plants	Frequency of haploids per 1000 plants
Zollerngold	1	21,000	0·05
Rigo	3	25,600	0·12
Nilla	12	25,600	0·47
Target	5	1,010	4·95

" Breeders " seed of the Canadian varieties had been produced in Canada, but it is very improbable that environmental factors during flowering accounted for the difference in production of haploids because similar differences were found between populations from selfed seed of the

TABLE 2

Frequency of haploids in spring varieties and inbred lines of oil-seed rape in 1968

Variety	Number of haploids	Total number of plants	Frequency of haploids per 1000 plants
Cresus	2	25,600	0·08
Nilla	5	16,800	0·30
Zollerngold	7	21,200	0·33
Rigo	8	23,850	0·34
Tanka	66	16,800	3·93
Target	95	16,800	5·65
Nugget	115	16,800	6·85
Inbred lines *ex.*			
Zollerngold	1	6,000	0·17
Nilla	1	5,000	0·20
Rigo	8	18,000	0·44
Erucic acid free line, No. 315	65	10,000	6·50

Canadian erucic acid-free line, No. 315, and selfed seed from plants from the varieties Nilla, Rigo and Zollerngold (table 2). This selfed seed was produced simultaneously from all varieties in the same glasshouse. Thus, the higher frequency of haploids in Canadian varieties of spring rape must be determined genetically.

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