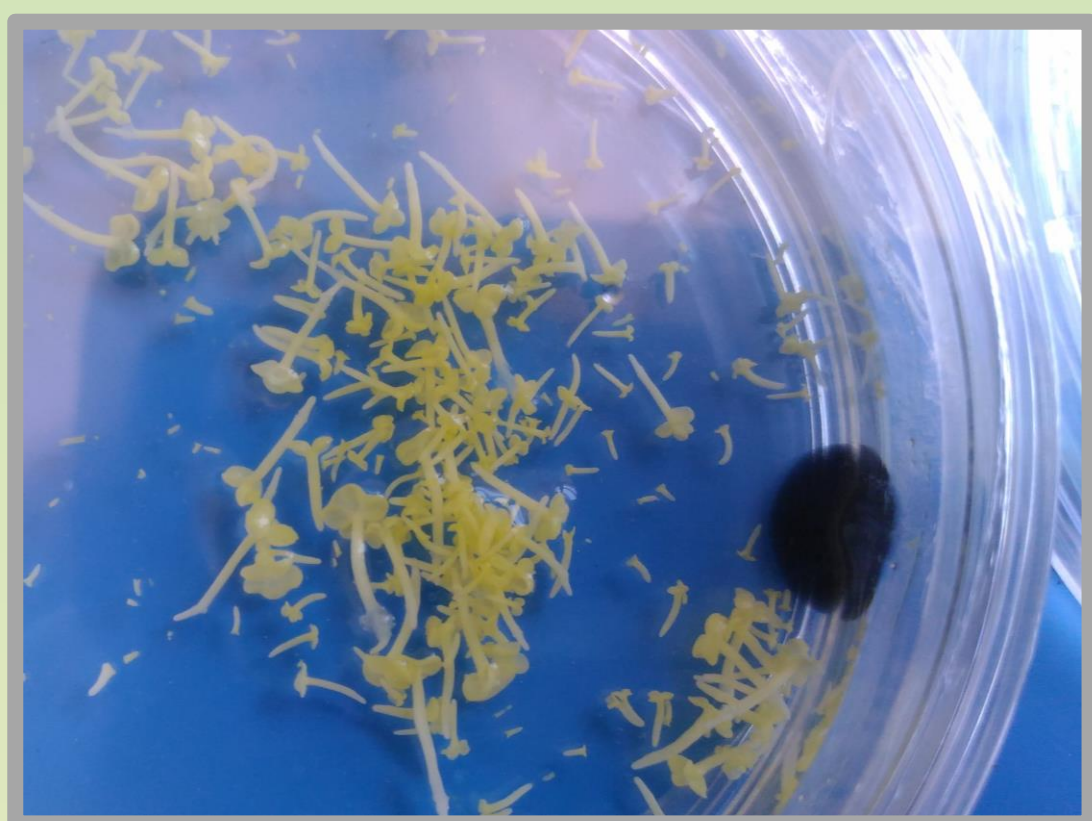




# Production and study of doubled haploids of spring *Brassica napus* cultivars of Russian breeding

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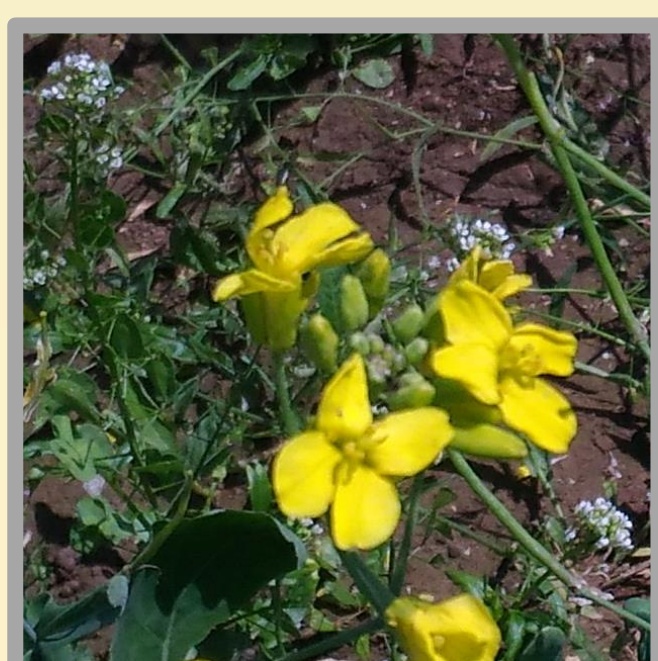
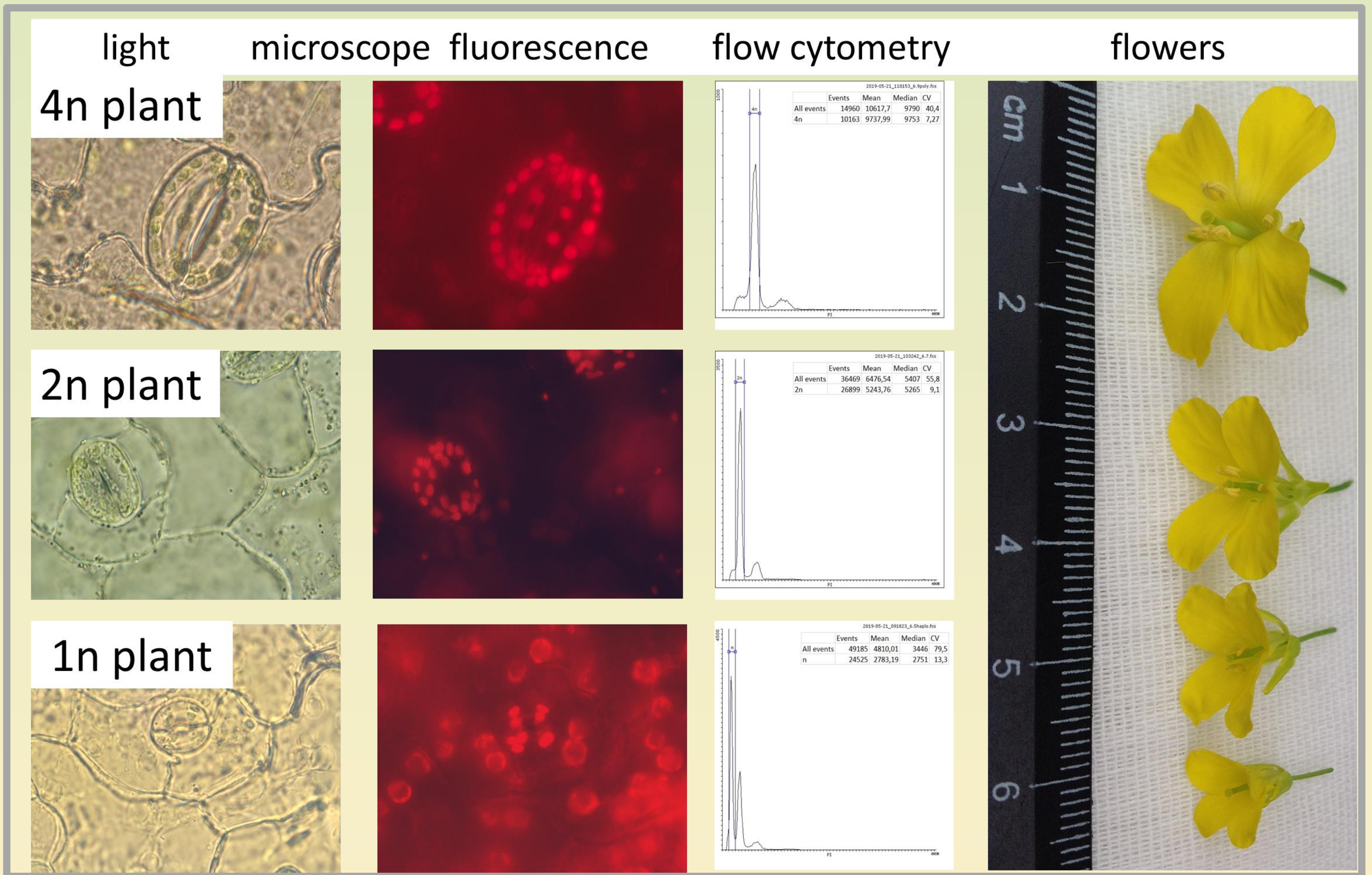


Breeding of rapeseed in Russia has traditionally been directed to creating varieties. The advantage of hybrids compared with varieties in yield and the ability to protect the copyright of breeders led to the start of breeding programs to create Russian spring rape hybrids. Spring rapeseed (*B. napus* L.) cultivars: cv 'Vikros', cv 'Grant', 'Lugovskoy' and 'Podmoskovniy' were used in the study. It has been shown that the majority of Russian varieties used into work are responsive to microspore embryogenesis.

The DH population of spring variety Vikros obtained in the isolated microspore culture was characterized for the ploidy of plants (haploid, tetraploid, and doubled haploid plants). It was shown that chromosome doubling occurs more often when cultured embryoids on a solid medium with the cytokinin phytohormones, which induced to secondary embryogenesis during which, perhaps, the cells have a endomitosis and the number of chromosomes is doubled. Thus, it was possible to increase the yield of spontaneous doubled haploids without colchicine treatment. It was shown that tetraploid plants or rapeseed have a powerful development of the vegetative mass, however, reduced seed productivity.



Determination of ploidy of regenerated plants was performed by counting chloroplasts in guard cells of stomata, because the number of plant chloroplasts correlates with the chromosome number; i.e., in diploid plants the chloroplast number is approximately two times lower than that of the haploid. The epidermal cell layer was removed from the underside of the leaves, then it was placed on a mount slide in a drop of water, covered, and viewed under an A2 Axio Imager fluorescence microscope (filter bank BR 490 and 515). The pictures of at least 10 pairs of guard cells of each plant were taken, and chloroplasts were counted.



DH lines were sown in the field and analyzed for phenotypic traits, yield, and biochemical composition of seeds. Among the doubled haploid lines, some lines have increased protein content and reduced fiber content, they is very valuable for obtaining hybrids. It was shown that a phenotypically homogeneous variety has a large variety of gametes, during the cultivation of microspores were obtained plants with different leaf shapes, habit and flower color.

