samples were collected 1986-1988 from different locations in the natural habitat and the 58 accessions were grown in 1988 in single plots to register phenological and yield data. Furthermore it was tried to enlarge genetic variation through mutation breeding by treating seeds with chemical mutagens as follows:

Ethyl methanesulfonate [EMS]		Sodium azide [NaN_3]	
0.4 %	3 hours	0.004M	2 hours
0.4 %	4 hours	0.006M	2 hours
1.0 %	6 hours	0.008M	3 hours

The M_1 generation was grown in the greenhouse in 1987, the M_2 in 1988 in the field. Oil content was measured with the nuclear magnetic resonance method (NMR), the vernolic acid content was determined by gas liquid chromatography of methyl esters prepared from the seed oil. The collected seed samples exhibited differences in yield but only a small variation in both oil and vernolic acid content, and in seed retention. From the mutagen-treated material some mutants were selected in desired direction, e.g. with four-seeded capsules, determinate growth and uniform ripening. The oil content and vernolic acid content of the mutants ranged from 43.5 to 49.3% (x=45.9%, s=1.3) and from 37.9 to 77.9% (x=66.8%, s=6.4), respectively.

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Performance of winter-rapeseed lines with an improved fatty acid composition

High levels of linoleic (C18:2) and low content of linolenic acid (C18:3) are desired traits for rapeseed. Induced mutants with an improved fatty acid composition derived from the spring-rapeseed variety "Oro" were crossed with a winter-rapeseed line exhibiting an increased C18:2 content and backcrossed two times with several high yielding cultivars of winter-rapeseed. After each cross the F_2 was screened by gaschromatography for the mutant-type. After the second backcross from each of 118 lines (BC_2-F_3) an observation plot (9.4 m^2) was sown.

Results show that through backcrossing it was possible to develop lines with a high proportion of C18:2 and a reduced level of C18:3, whereas C18:1 remained unchanged, demonstrating new combinations different from the usual positive correlation between C18:2 and C18:3. Yield increased continuously with decreasing portion of the mutant genome. Relatively low genotype x location interaction for fatty acids was found.

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Results of breeding for modified C18-fatty acid composition in sunflower

In an earlier experiment, KUEBLER was able to select sunflower lines with modified fatty acid composition after induced mutagenesis. From this material, genotypes with more than 80% linoleic acid content could be selected, whereas the highest level of oleic acid obtained was 30% under field conditions and up to 50% in the phytotron. Recently, inbred lines with up to 90% oleic acid could be selected from a progeny of the Russian cultivar "Pervenets", which has high oleic acid content inherited by one major, partially dominant gene. The inheritance of oleic/linoleic acid content in our own material is not fully understood yet, but is highly heritable.

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