

High Oleic Acid Content in New Safflower, UC-1



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BASIC GENETIC RESEARCH on safflower introduced to the United States from many parts of the world has turned up a gene with an unusual faculty. This gene changes the proportions of oleic and linoleic acid in the oil, and makes safflower oil chemically like olive oil. Unfortunately, the gene was found in an introduction (UC57-147) which was not suitable for commercial production in this country because of its low yield and low oil content. By crossing UC57-147 to N-10, and then backcrossing the products of the cross twice to US-10, it was possible to transfer the gene to an acceptable commercial safflower type. This type has been termed UC-1. The fatty acid composition of UC-1 and other oils may be noted in the table; the graph

compares UC-1 with US-10 in fatty acid composition of the oil.

Oilseed processors have expressed a serious interest in the possible value of this oil for industries requiring oleic acid. Some of it may also be used in edible products. However, evaluation of the oil will require rather large scale utilization tests with many tons of oil. Companies have already asked the University to release a selection which they could increase in a short period of time. The selection would also be used in other breeding programs.

UC-1 is genetic stock and not a finished variety. It is similar to US-10, but not identical to it. The average oil content, on a moisture-free basis, is about 36%, the iodine value is about 90, and

Safflower plant on left, in photo above, is US-10, a commercial variety; on right the Indian introduction, UC57-147 with the gene for the new safflower oil; and center, UC-1 genetic stock that is similar to US-10 but has the new oil.

the percentage of fatty acid composition is: oleic acid, 78; linoleic acid, 15; stearic acid, 1; and palmitic acid, 6. Seed supply has been too scarce for yield tests. Like US-10, UC-1 has yellow flowers and spines.

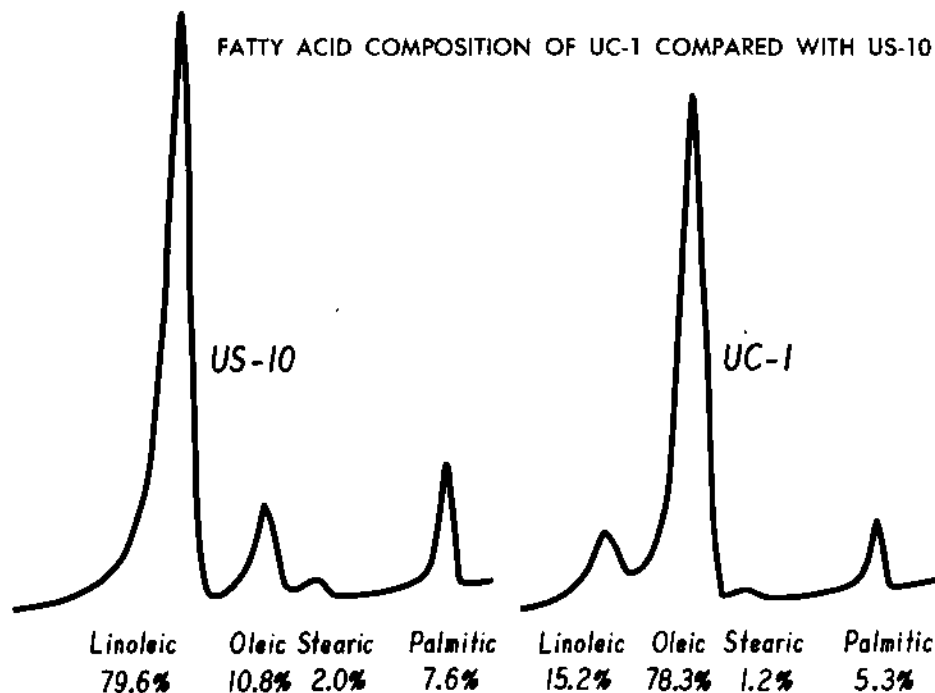
Although supplies of UC-1 are scarce, small samples in two sizes are being prepared for distribution. Two hundred grams will be supplied to companies planning utilization tests as soon as possible, and 5 grams for those interested in using it for breeding programs.

CHARACTERISTICS OF STANDARD AND NEW SAFFLOWER OILS COMPARED WITH OILS FROM OTHER CROPS

Oilseed Crop	Fatty acid composition, percentage					
	Linolenic	Linoleic	Oleic	Stearic	Palmitic	Other
Standard safflower		78.1	13.5	1.8	6.6	
New safflower (UC-1)		15.2	78.3	1.2	5.3	
Olive	6.5	6.5	82.1	2.0	9.2	0.2
Soybean	6.5	50.4	29.7	2.4	9.7	1.3
Cottonseed		41.2	32.1	2.9	21.7	2.1
Corn		41.7	46.3	3.6	7.8	0.6
Linseed	47.4	24.1	19.0	2.5	6.3	0.7

The Department of Agronomy at Davis will also increase UC-1 for utilization tests in cooperation with the Western Utilization Research and Development Division, USDA, in Albany, California. The Department will continue to improve upon UC-1 in the hope that a fully tested commercial variety may be available in a few years.

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Area under each peak in relation to total area of all peaks indicates amount of each fatty acid in the oil.