determined with gas chromatography by J. E. Marion of the Food Processing Department at the Georgia Experiment Station.

M. D. Jellum

2. Correlation coefficients involving oil content and five fatty acids of corn oil.

In addition to genetic studies involving fatty acids of corn oil, it is desirable to determine the relationships which exist among the fatty acids or between the fatty acids and total oil content. Nine commercial hybrids were grown at five locations in 1962 and at six locations in 1963. Plantings were made on three dates at one of these locations in both years. Correlation coefficients were calculated for hybrids at individual locations and also for individual hybrids over locations. Results were similar for both 1962 and 1963. Therefore, only a representative sample of correlation coefficients are given in Table 1 for the individual locations in 1963 and for the total over locations in 1962 and 1963.

In general, all correlations involving linolenic acid were very low and nonsignificant. As palmitic acid increased, there was a tendency for stearic acid to increase. Palmitic acid and oil content were positively correlated and palmitic acid and linoleic acid were negatively correlated. Stearic acid had a weak positive correlation with oleic acid and oil content. A quite high negative correlation was obtained between stearic and linoleic acids. The two major fatty acids in corn oil are oleic and linoleic. These two fatty acids have a very high negative correlation coefficient. Work at the University of Illinois has indicated that oleic and linoleic acid content of the oil is controlled by a single gene. The Illinois workers have proposed that oleic acid is the precursor of linoleic acid. If this is true, then a negative correlation approaching the value of 1 would be expected on a single kernel basis. A quite high positive correlation existed between oleic acid and oil content and a high negative correlation was shown between linoleic acid and oil content. However, the relationship of oleic and linoleic acids with oil content is not so high that selection for high oil and high linoleic acid could not be made. Some inbred lines and hybrids have been found to be high in oil content and in linoleic acid proportion of the oil.

M. D. Jellum

Table 1
Correlation Coefficients Among Five Fatty Acids of Corn Oil and Between Fatty Acids and Total Oil Content

Character	Locations (1) Experiment	(2) Hamil Farm	(3) Perry	(4) Calhoun	(5) Blairsville	(6) Florida Nursery	(7) 1963 Total	(8) 1962 Total
Palmitic - Stearic	0.29	0.25	0.50*	0.26	0.60**	0.53*	0.38**	0.46**
" - Oleic	0.04	0.44	0.29	0.03	0.55*	0.24	0.27**	0.12
" - Linoleic	-0.50*	-0.68**	-0.66**	-0.41	-0.77**	-0.66**	-0.61**	-0.54**
" - Linolenic	-0.25	-0.57*	0.12	-0.08	-0.34	-0.01	-0.14	-0.11
" - Oil (%)	0.50*	0.57*	0.64**	0.42	0.72**	0.70**	0.57**	0.59**
Stearic - Oleic	0.10	0.26	0.63**	0.51*	0.65**	0.51*	0.48**	0.43**
" - Linoleic	-0.38	-0.39	-0.78**	-0.65**	-0.74**	-0.66**	-0.64**	-0.66**
" - Linolenic	0.12	0.00	-0.12	0.00	-0.13	-0.36	0.01	0.28**
" - Oil (%)	0.11	0.38	0.49*	0.29	0.63**	0.34	0.31**	0.43**
Oleic - Linoleic	-0.86**	-0.95**	-0.90**	-0.91**	-0.95**	-0.89**	-0.91**	-0.88**
" - Linolenic	-0.53*	-0.69**	-0.41	-0.11	-0.15	-0.22	-0.30**	-0.12
" - Oil (%)	0.62**	0.77**	0.69**	0.71**	0.80**	0.45	0.56**	0.58**
Linoleic - Linolenic	0.47*	0.67**	0.20	0.04	0.12	0.14	0.20*	0.06
" - Oil (%)	-0.75**	-0.79**	-0.80**	-0.81**	-0.86**	-0.67**	-0.68**	-0.73**
Linolenic - Oil (%)	-0.40	-0.72**	-0.11	0.02	-0.21	-0.02	-0.08	-0.23**

(1) Experiment: Data from the first planting date. Located in the Piedmont region.
(2) Hamil Farm: Located near Experiment. Corn grown at high fertility level.
(3) Perry: Located in the Upper Coastal Plain region.
(4) Calhoun: Located in the Limestone Valley region.
(5) Blairsville: Located in the Mountain region.
(6) Florida Nursery: Grown at Goulds, Florida during the 1963-1964 winter.
(7) Total of six locations including the three planting dates at the Experiment location.
(8) Total of five locations including three planting dates at the Experiment location.