

Peppermint Fertility Experiment

The objective of the experiment is to determine whether phosphate, potash and sulfur will give oil yield responses above the 75 pound level of P_2O_5 , K_2O and S. A previous experiment indicated that at high nitrogen levels one or more of the fertilizers may greatly increase yield when applied at levels above 75 pounds per acre. From experiments with other crops these levels appeared to adequately supply the plant requirements.

During 1963 two locations of the experiment were established; however one of the locations (a new planting) had a very erratic stand. Some information was taken but will not be presented in the report.

Sid Elliot Location:

The location on the Sid Elliot farm at Trail Crossings (approximately four miles southeast of Culver) was established on a Metolius sandy loam and the experimental location has the following cropping history:

1962	Mint	600# 10-16-8 and 250# Urea	60# Oil
1961	Row mint	16-20 and Urea	50# Oil
1960	Burt wheat	300# Ammonium Sulfate	70 bu.
1959	Potatoes	600# 10-16-8 & 200# Am. Sulf.	14-15 tons
1958	Grain		
1957	Alfalfa		

The soil analysis results are as follows:

Soil Depth	pH	Pounds/Acre		me./100 g. soil				ppm B	% OM
		P_2O_5	K_2O	K	Ca.	Mg.	CEC		
0-8	6.0	31.5	655	.84	6.9	3.3	13.8	.50	1.29
8-16	6.2	9.5	515	.66	7.8	3.5	13.7	.39	.95
16-24	6.4	8.0	468	.60	9.1	4.5	16.3	.34	.81

With the present concept of soil test values, this soil should be a medium-high producing field as far as plant nutrients are concerned.

The treatments applied and the average yield of oil in pounds per acre are shown in Table No. 19. Yields by replication are presented in Appendix Table No. 24.

None of the treatments produced significant differences in yield. The main effects of the phosphate, potash and sulfur treatments for the last two years (1962 data may be found in 1962 Annual Report of the Station) on the Sid Elliot farm are as follows:

<u>P₂O₅</u>	<u>1962</u>	<u>1963</u>
75	79.7	69.4
150	76.7	70.7
<u>K₂O</u>		
75	74.6	71.7
150	81.7	68.4
<u>S</u>		
75	79.9	72.6
150	76.5	67.5

From this data there appears to be no advantage in increasing rates of phosphate or sulfur above 75 pounds. The response to an additional 75 pounds K₂O appears to have had some effect in 1962 but no effect in 1963. The most marked effect came during the very warm summer of 1961 when an added 75 pounds of P₂O₅, K₂O and S increased oil yield by 20 pounds of oil per acre.

The big problem with mint research is finding a method of producing significant and reproducible results. The present method of harvesting a designated area and distilling the material in an experimental still has not been satisfactory. This method is very costly and time consuming on a per plot basis.

Table No. 19

The Effect of Several Combinations of Rates of Nitrogen, Phosphate,
Potash and Sulfur on the Yield of Peppermint Oil
Sid Elliot Farm - Trail Crossing, Oregon - 1963

Fertilizer Application Pounds Per Acre				Yield of Oil Pounds/Acre
N	P ₂ O ₅	K ₂ O	S	
125	-	-	-	66.2
125	75	75	75	64.3
125	150	150	150	61.9
250	75	75	75	79.8
250	150	75	75	75.0
250	75	150	75	75.7
250	75	75	150	61.8
250	150	150	75	68.0
250	150	75	150	77.7
250	75	150	150	65.5
250	150	150	150	70.7
375	150	150	150	71.7
Significance Coefficient of Variation				N.S. 19.0%

Appendix Table No. 24

The Effect of Several Combinations of Rates of Nitrogen, Phosphate,
Potash and Sulfur on the Yield of Peppermint Oil
Yields Shown for Replication and Average in Pounds of Oil Per Acre

Sid Elliot Farm - Trail Crossing, Oregon - 1963

Fertilizer Application Pounds Per Acre				Replication				Ave.
N	P ₂ O ₅	K ₂ O	S	I	II	III	IV	
125	-	-	-	76.98	31.92	76.98	78.86	66.2
125	75	75	75	50.69	90.12	58.20	58.33	64.3
125	150	150	150	57.43*	69.47	58.20	62.58	61.9
250	75	75	75	88.25	90.12	73.23	67.59	79.8
250	150	75	75	75.48	76.60	70.41	77.60	75.0
250	75	150	75	78.86	80.11	70.41	73.60	75.7
250	75	75	150	46.94	87.62	57.58	55.07	61.8
250	150	150	75	52.57	72.60	94.63	52.07	68.0
250	150	75	150	67.59	81.11	76.04	86.12	77.7
250	75	150	150	56.33	81.67	63.84	60.08	65.5
250	150	150	150	71.35	73.23	62.58	75.48	70.7
375	150	150	150	55.07	81.67	90.12	60.08	71.7
Coefficient of Variation								19.0%

*Corrected Yield