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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

Distribution:
LIMITED

ID/WG.99/95
26 November 1971

United Nations Industrial Development Organization

Original: ENGLISH

Second Interregional Fertilizer Symposium

Kiev, USSR, 21 September - 1 October 1971
New Delhi, India, 2 - 13 October 1971

Agenda item II/6

THE FERTILIZER INDUSTRY OF ETHIOPIA[1/]

by

Mammo Bahta

Ethiopia

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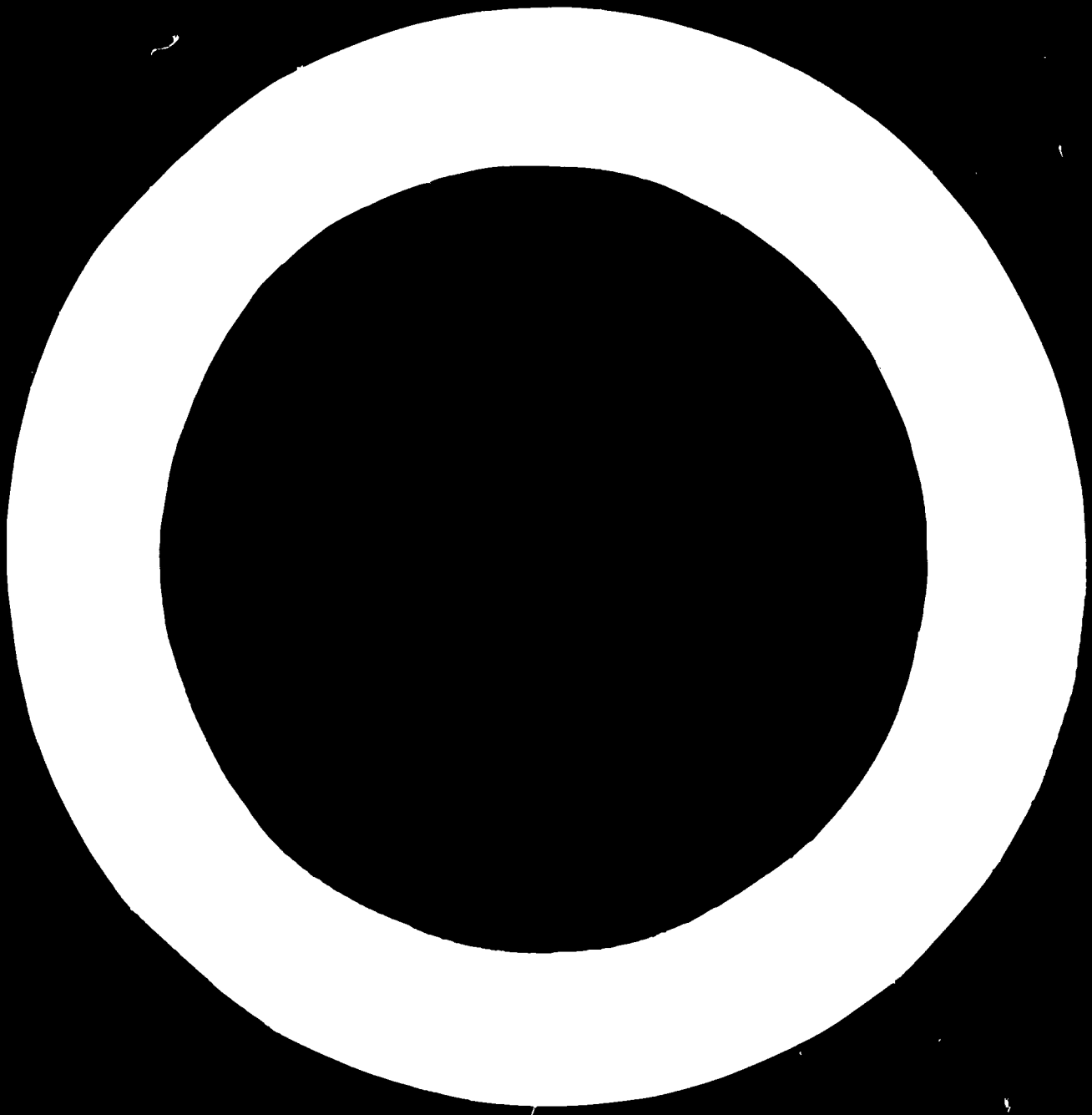

Introduction:

1. The purpose of this note is to give some idea of the progress being made in Ethiopia in the determination, introduction and planned promotion of suitable commercial fertilizers in order to increase agricultural production on a scale large enough to further stimulate overall economic development with the ultimate objective of raising the nation's standard of living. The note is based on the latest reports of the Fertilizer Programme launched a few years ago by the Imperial Ethiopian Government in co-operation with FAO. It is important to appreciate that the account presented here is intended to be only broadly indicative as it is based on partial and tentative information.

2. The topics covered in lude (a) crop re.ponses, (b) oonsumption levels and estimated future requirements, (c) fertilizer distribution, and (d) contemplated pre-feasibility study on fertilizers and pesticides.

Crop Responses:

3. Soil-test results reveal that the soils of Highland Ethiopia are in general deficient in nitrogen and phosphate; deficiencies in

in potash are encountered in few places. A total of 1578 fertilizer trials carried out durin the first three years of the Fertilizer Programme (1967-68, 1968-69, 1969-70) confirm these results: in the majority of cases, the soils are responsive to both single and combined applications of nitrogenous and phosphatic fertilizers. Table 1 below summarizes the results for the year 1969-70. (These results proved less satisfactory than those for the preceding year partly because some of the demonstrations were spoiled by natural causes).

Table 1: Crop Response to Fertilizer in Ethiopia, 1969-70
(Quintals/hectare)

Crop	No. of Observations	N	P	NP	NPK	Control Yields
Teff	307	10.4	11.4	14.6	15.6	7.3
Wheat	154	12.2	13.2	16.4	17.4	9.2
Barley	47	14.7	16.7	21.0	20.7	11.3
Grain Sorghum	48	34.8	28.2	42.7	44.8	18.6
Maize	27	24.6	23.3	32.4	38.5	16.0
Noog	11	8.3	9.4	11.8	12.1	4.8

Note: Application rates (in kgs/hectare) are:

	N	P	NP	NPK
Teff, Wheat, Barley, Oil seeds	40	46	40-46	40-46-37.5
Maize, Sorghum	60	69	60-69	60-69-37.5

4. Table 2 presents an economic analysis of the value of fertiliser application for teff, wheat and barley. The calculations are based on fertiliser costs and crop prices that are considered realistic. The analysis shows that the value of the yield increases more than pays for the cost of the fertiliser.

Table 2: Profitability of Fertiliser Applications
(Additional Eth$/ha.)

Crop	Year	N	P	NP	NPK
Teff	1967-68	40	72	141	126
"	1968-69	88	104	195	200
"	1969-70	69	97	170	168
Wheat	1967-68	36	46	114	93
"	1968-69	38	52	108	87
"	1969-70	36	54	94	82
Barley	1967-68	28	36	62	30
"	1968-69	51	56	109	82
"	1969-70	31	63	111	71

Consumption Level and Estimated Future Requirements:

5. Fertilizer use in Ethiopia is at a very low level but has been growing rapidly since 1969 mainly as a result of the launching of the FAO Fertilizer Programme and agricultural development schemes such as the Chilalo Agricultural Development Unit (CADU). The average national consumption of N, P_2O_5 and K_2O (on an estimated cropland of 11,652,000 ha.) has gone up from 0.28 to 0.44 kg. per hectare between 1969 and 1970. A small number of big estates (sugar, cotton, etc.) account for over 50% of the fertilizer consumed in the country. However, the percentage used on small farms in areas where agricultural development programmes have been initiated is increasing fast; it is estimated that total purchases by such farms have increased from nearly nothing in 1967 to about 5,000 tons in 1970.

6. Apparent fertilizer consumption as estimated from the sales figures of fertilizer importers are given in Table 3 for the period 1967-1970. Table 4 shows that the consumption of P_2O_5 is increasing whereas that of K_2O is declining, a trend dictated by soil characteristics. Details of the types of fertilizers used in Ethiopia are presented in Annex I. Annex II attempts estimates of probable future requirements on the basis of conservative assumptions about additional acreages to be fertilized in the next five years.

Table 3: Apparent Fertilizer Consumption in Ethiopia, 1967-70

Year	Fertilizers		Plant Nutrients		% of Nutrients
	Tons	% Increase	Tons	% Increase	
1967	2,891		1,028		35.5
1968	2,066*	- 28.5	844	- 17.8	40.8
1969	7,813	278.1	3,180	276.7	40.7
1970	10,774	37.9	5,137	61.5	47.7**

Table 4: Relative Importance of Plant Nutrients in Ethiopia, 1967-70

Nutrient	1967		1968		1969		1970	
	Tons	%	Tons	%	Tons	%	Tons	%
N	580	56.4	410	49	2289	72.0	2897	56.5
P_2O_5	204	19.9	246	29	694	21.8	1859	36.1
K_2O	244	23.7	188	22	196	6.2	381	7.4
Total	1028	100	844	100	3179	100	5137	100

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* Apparent decline due to the purchase of 1,000 tons in 1967 by one big estate for use in subsequent years.

** Jump due to the increase in the use of Diammoniaphosphate (DAP) from 370.4 tons in 1969 to 2,480 tons in 1970.

Distribution and Fertilizer Cost:

7. The entire amount of commercial fertilizers consumed in Ethiopia is imported and sold by some 12 firms. Importing fertilizers constitutes only a small percentage of the overall business operations of these firms and consequently they have no real incentive to establish an extensive and efficient distribution network; there are stores in only 11 places in the country. (See map at the end). As a result, fertilizer is not available to small farmers at the place and time needed, and only limited effort is made by distributors to promote its widespread use through the provision of credit and other facilities. The present distribution and sales system may therefore be partly responsible for the limited fertilizer consumption.

8. Because of the small market demand, high transport and handling costs, and poor marketing arrangements, fertilizer prices in Ethiopia are high, but competition in recent years has tended to bring them down to a more reasonable level as the figures in Table 5 below indicate. Transport costs may represent as high as 50% of the final price paid by farmers. For example, the final price of Urea to a farmer 300 kms. away from Addis Ababa may vary between Eth$300 and Eth$350 per metric ton and Eth$153 of this may represent cost of transportation.

Table 5: Fertilizer Prices in Eth$/quintal

Year	Urea	Triple Super-phosphate	Sulphate of Potash	Diammonium-phosphate
1967	47.94	40.80	38.70	-
1968	33.65	42.65	31.62	-
1969	30.10	31.60	30.10	40.80
1970	27.75	32.20	32.40	36.42

Note: These prices were obtained through an FAO Fertilizer Programme tender. They are ex-store Addis Ababa and include a 2% turnover tax.

9. Reporting on fertiliser consumption and distribution in Ethiopia, the Fertilizer Programme makes the following observations:

a/ Too many types of fertilizers are now being imported into Ethiopia and companies should be advised to reduce the number because:

(i) Recommending use of too many types of fertilizers will confuse farmers just starting to use fertilizers.

(ii) Farmers' present knowledge about fertilizers is not advanced enough to enable them to compare the nutrient content and the price of different types of fertilizers.

(iii) Conditions now prevailing in Ethiopia (especially high transport costs) allow only the introduction of the least expensive high-grade fertilizers.

(iv) Retailers entering the fertilizer business on a small scale are not in a position to keep in stock a large number of different fertilizers.

b/ Diammoniumphosphate is the least expensive, high-grade fertilizer that will undoubtedly become the most popular fertilizer in Ethiopia.

c/ Fertilizer companies are willing to take responsibility for the distribution of fertilizers if:

(i) Government takes steps to further stimulate the demand for fertilizers. Stimulating measurers would include expanding the road network, increasing the size and effectiveness of the extension force, provision of credit, introduction of better seed varieties and cultural practices.

(ii) Profits on fertilizer distribution are reasonable. As market demand grows, these are likely to be quite substantial and it may be necessary for the Government to keep an eye on future price movements.

Contemplated Pre-feasibility Study on Fertilizers and Pesticides:

10. The Imperial Ethiopian Government is taking determined steps to develop agriculture on a scale and at a pace concomant with the importance of that industry to the national economy. Modest beginnings have already been made in the development of basic facilities and services, such as research, credit, extension work, and project identification and preparation. The use of new inputs and techniques is considered essential if a vigorous spur to Ethiopia's agriculture is desired.

11. It is considered that the application of fertilizers and pesticides on a large scale offers one of the best ways of bringing about such a spur to agriculture. The impact of these new inputs would be even greater if Ethiopia can develop its own fertilizer and pesticides industry. This thinking has now developed into the planning of a pre-feasibility study for the establishment of fertilizer and pesticides processing plants in Ethiopia.

12. Broad terms of reference have already been prepared for the contemplated pre-feasibility study and a request for a team of three experts has been submitted to UNIDO. UNIDO has agreed to make the three experts available and has already proposed two candidates for the post of Senior Economist for a period of 4 to 6 months. It is anticipated that work on the study will start in two to three months.

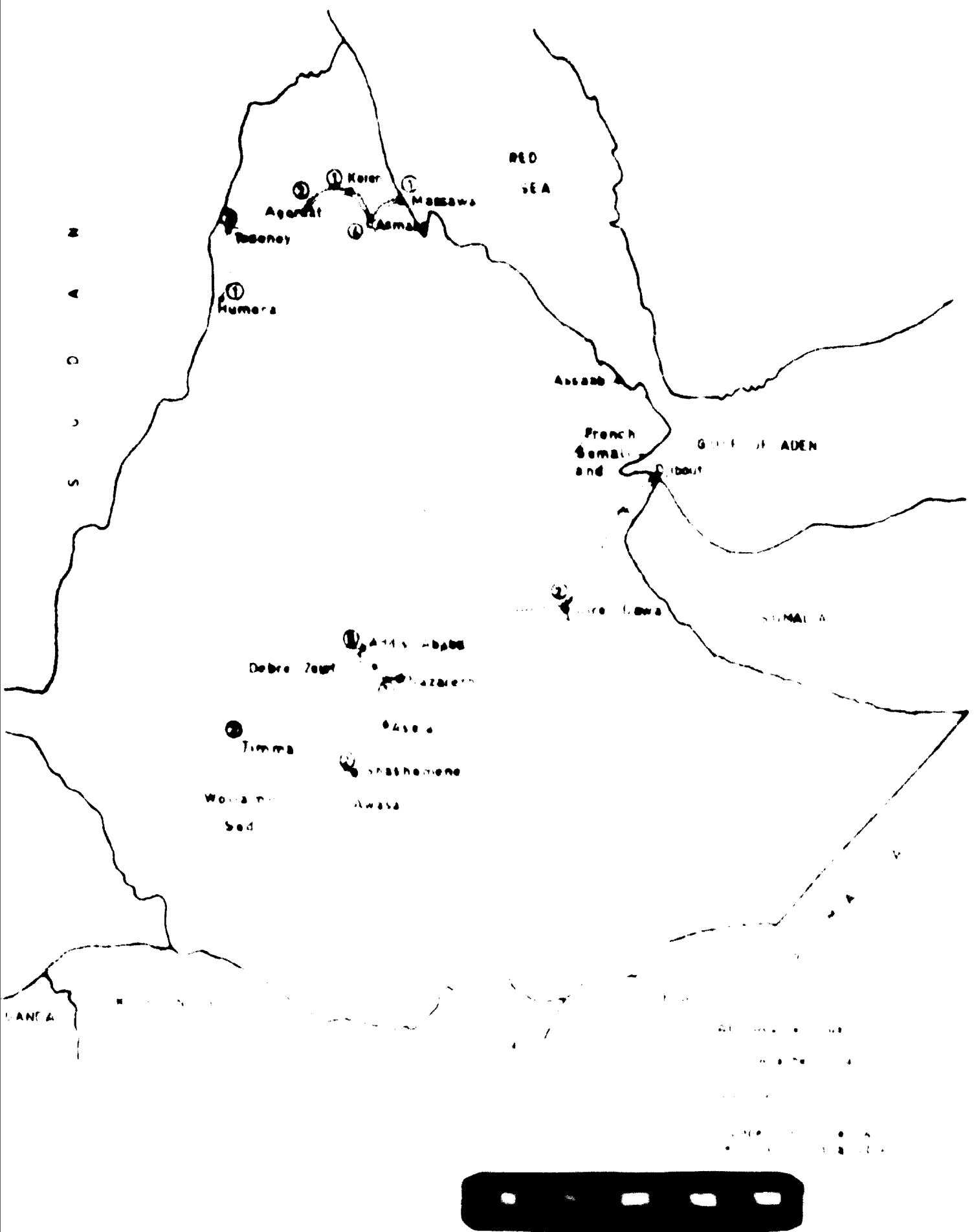
Annex I: Fertilizer Types Used in Ethiopia

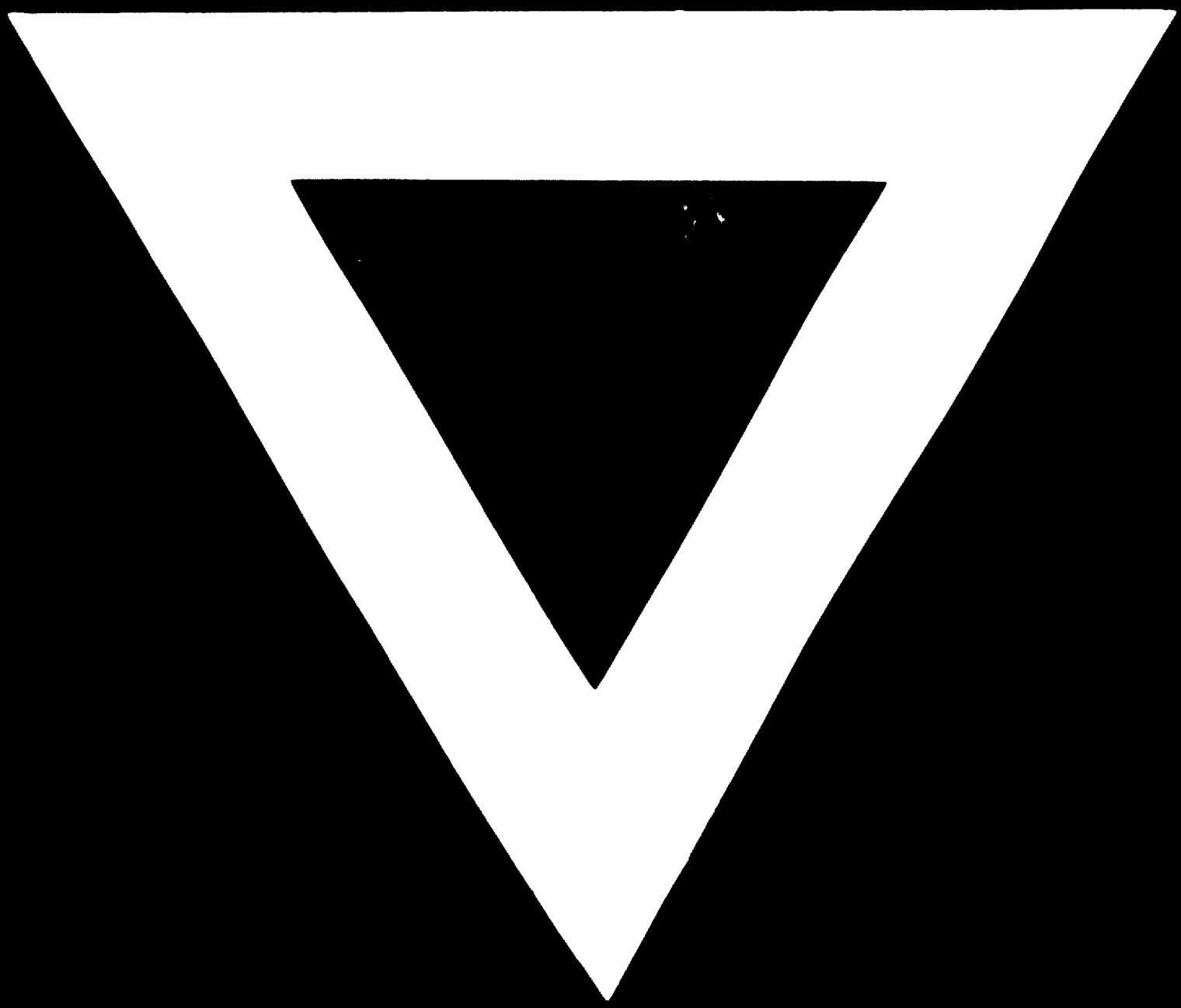
	1967	1968	1969	1970
A. Straight fertilizers				
1. N-fertilizers				
Calcium Ammonium Nitrate 23%	10	-	5	-
Ammonium Sulphate 21%	60	145.5	927	829
Ammonium Sulphate Nitrate 26%	1015	30	600	30
Ammonium Nitrate 26%	10	10	69	82
Urea 46%	168	331.7	3421.1	3779
2. P-fertilizers				
Basic Slag 18%	10.5	8.3	-	1.5
Triple Superphosphate 46%	52.5	109.8	672.7	531
3. K-fertilizers				
Sulphate of Potash 50/52%	54	48	166.6	106.4
B. Compound fertilizers				
1. NP-fertilizers				
Diammoniumphosphate 18-45/48	4	20	270.4	2480
23-23-0	-	-	65.3	60
20-20-0	80	245.5	574	669
20-10-0	79	113	86	102
36-14-0	-	-	0.6	4
2. NK-fertilizers				
20-0-20	-	-	5.5	24.5
19-0-19	-	-	26	14
25-0-10	47	-	-	-
3. NPK-fertilizers				
17-17-17	184	148	201	1072
15-15-15	30	195.5	193.6	130
14-14-14	220	1	-	-
15-15-6-4	155	130	40	150
13-13-21	-	-	26	25
13-13-20	201	148	152	18
12-12-18	-	-	-	110
12-12-17-2	120	140	0.7	225
20-10-10	32	6	8	102
8-24-24	-	-	20	-
25-5-5	-	-	103.5	90
11-22-16	5	12	26	-
10-5-20-1	354	224	153	140
TOTAL	2891.0	2066.3	7813.3	10774.4

Annex II: Estimate of Crop Fertilizer Requirements in Ethiopia in the Next Five Years

Crop	Present Area ('000 ha.)	Area Expected to be fertilized ('000 ha.)	%	Average Amount of Fertilizer Needed in Tons: Urea or Equivalent	Average Amount of Fertilizer Needed in Tons: Superphosphate or Equivalent
Wheat	1,029	50	5	5,000	5,000
Barley	1,693	34	2	3,000	3,000
Maize	828	40	5	4,000	4,000
Sorghum	1,174	-	-	-	-
Teff	2,154	50	2.5	5,000	5,000
Cotton	30	15	50	3,000	1,500
Sugar Cane	15	15	100	4,500	1,500
Pulses	824	-	-	-	-
Oilseeds	810	-	-	-	-
TOTAL				24,500	20,000

FERTILIZER DISTRIBUTION CENTERS IN ETHIOPIA





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