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STATUS OF THE FERTILIZER AND PESTICIDES INDUSTRIES IN TURKEY 1/

by

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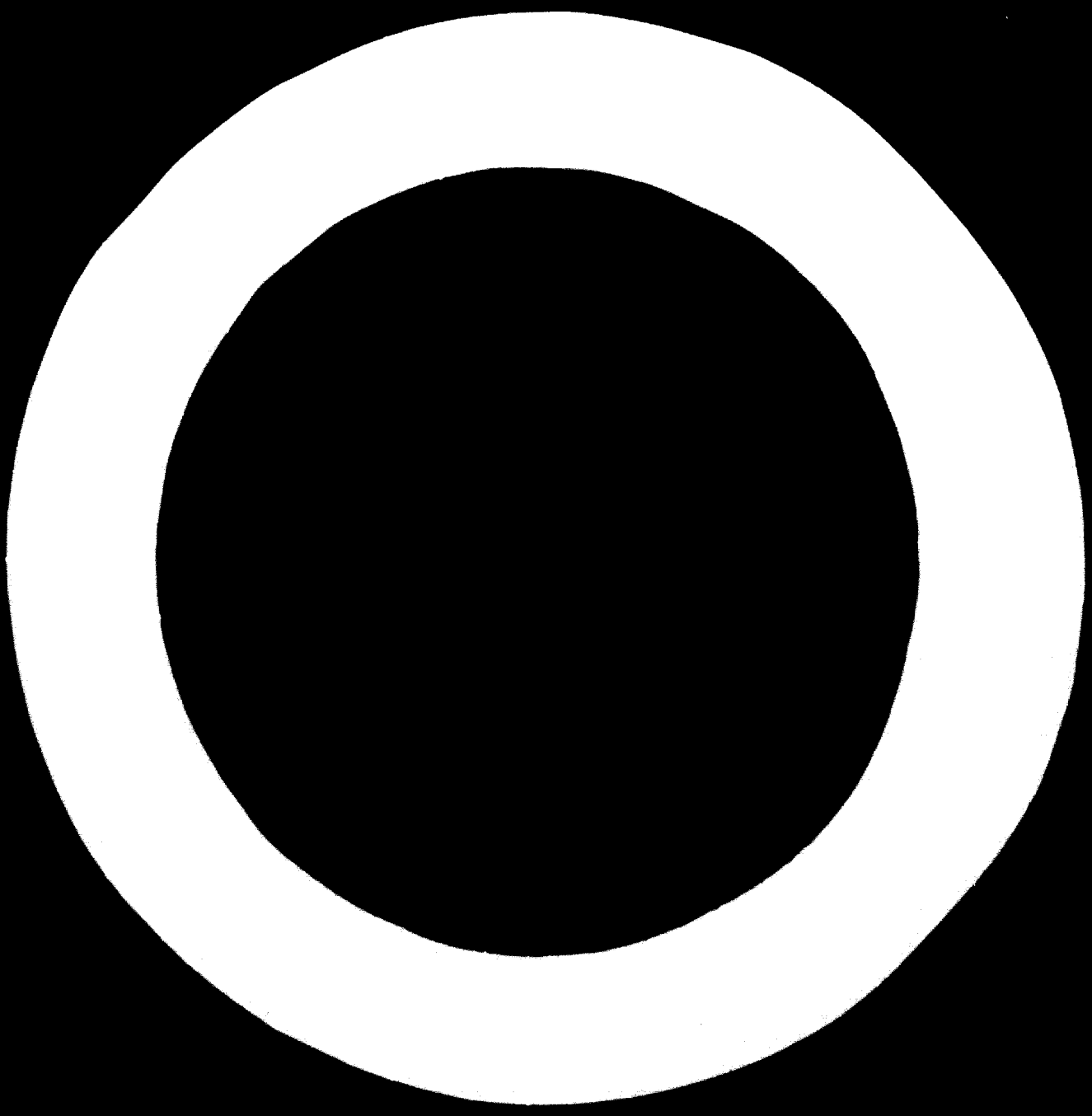

The Status, the future and the main problems of the fertilizer/ pesticides industries in Turkey

and

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A-The Fertilizer Industry in Turkey

1-The Status of the Fertilizer Industry

1.1-Production

Main fertilizer production corporations in Turkey as follows:

a-Turkish Nitrogen Industries Inc.
Produces nitrogen and phosphorus based fertilisers

b-Fertilizer Plants Inc.
Produces phosphorus based fertilizers

c-Mediterranean Fertilizer Industries Inc.
Produces nitrogen and phosphorus based fertilisers

d-Karabük Steel -Iron Industries Inc.
Produces nitrogen and phosphorus based fertilizers

The amount of production of various fertilisers by the plants of those companies are as follows:

a-Turkish Nitrogen Industries Inc.

a-1.Kütahya Plants

Ammonium Sulphate	% 21% N	80,000 MT/Y
" Nitrate	20,5 % N	60,000 MT/T
" "	26 % N	338,000 "

a-2.Samsun Plants

(Triplesuperphosphate)	TSP 45 % P205	220,000 MT/Y
or (Diammonium Phosphate)	(18-46-0)	130,500 "

a-3.Elazig Plants

Normalsuperphosphate, 18% P205	220,000 MT/Y

b- Fertilizer Plants Inc.

b-1.Iskenderun Plant

TSP 43-45 % P205	100,000 MT/Y

b-2.Yarimca Plant

Normal Superphosphate NSP 16-18%P205	100,000 MT/Y

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c-Mediterranean Fertilizer Industries Inc.

Ammonium Nitrate	26 % N	600,000 MT/Y
Diammonium Phosphate	18-46-0	150,000 "

d-Karabük Iron-Steel Industries Inc.

Ammonium Sulphate	21 % N	8,500 MT/Y
Single Superphosphate	16-18 % P_2O_5	22,000 "

1.2-Consumption

The production and consumption of fertilizer,in Turkey, since 1967 is as follows:

Year	Production (ooo mt/y)		Consumption (ooo mt/y)	
	21% N	18 % P_2O_5	21% N	18% P_2O_5
1967	134	206	705	687
1968	164	274	918	164
1969	248	241	1167	1154
1970	382	364	1213	1059
1971	953	1092	1300	2000

1.3- Fertilizer Plants

Kütahya Plants :This Complex is located in the part of the central Anatolia.It is accessible by the rail road and the highways facilities.The ammonia the nitric acid and the salt production plants are its main section.In the Kütahya Plants the following fertilizers are produced:

Ammonium Nitrate, 20,5% N the process used is UASP.

Ammonia is produced by the Haber-Bosch method.

Ammonium Sulphate, 21 % N : It is produced by the prilling method of Kalton-Bach.The necessary ammonia is manifactured by the Casale method.

Samsun Plants: This Complex is located in the central Black Sea coast. It is accessible by the maritime and the highway facilities.The Phosphoric acid and the Triple Superphosphate or the DAP plants are its major sections.The SIAPI-Chemie-Bau process is used to

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produce the TSP.Also,by using Chemie-bau-Olin process, the DAP can be manufactured.

Elazığ Plant: This plant is located in the south-east part of the Anatolia.It is accessible by the rail-road and the highway facilities.The acidification and the granulation units are the major parts of the plants.The process used is INDUSTRIAL-EXPORT and the MORINZ Reactor is employed.

Iskenderun Plant :This Plant is located in the eastern cost of the Mediterranean Sea.It is accessible by the rail road, the maritime and the highway facilities.In this Plant,the TSP is produced by the BROADFIELD-DEN method.

Yarımca Plant: This Plant is located in the south-eastern cost of the Marmara Sea.It is accessible by the rail road,the maritime and the highway facilities.In this plant the NSP is produced by the BROADFIELD-DEN method.

Mersin Plants : This complex is located in the eastern cost of the Mediterranean Sea.It is accessible by the rail road, the maritime and the highway facilities.The Phosphoric,the nitric and the sulphric acid plants,and the DAP and the Ammonium Nitrate plants are its major sections.

Karabük Plant: This Complex is located in the north-western part of the central Anatolia.It is accessible by the rail-road and the highway facilities.The ammonia in the coke oven gas obtained from the coke plant of this complex is treated with sulphric acid in semi-direct method to produce the ammonium sulphate, 21 % N , as by-product.In this complex the NSP, 16-18 % P_2O_5 ,is also produced by using the MAKWELL method.

1.4-Raw Materials

The main raw materials of the fertilizer industry are coal,naphta,fuel-oil,roast gases and,phosphorous and sulphrous rocks.The compounds as the ammonia,nitric, sulphric and the phosphoric acid are obtained from these

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raw materials and then converted to various fertilized products.

Sulphric acid: It is estimated that 45,000 MT of sulfric acid will consumed other than fertilizer industries, in 1972. At the present time the following plants manifacture sulfric acid:

-Karabük Plants: Annual production is 20,000 MT .The acid is produced in the pyrite roasters and is sold to the market.

-Murgul Copper Complex: Annual production is 20,000 MT. The acid is produced from the roast gases and is sold to the market.

Samsun Plants: Samsun Sulfric Acid unit which is a part of the TSP plants uses pyrite roastes and has the capacity of 215,000 MT/Y.

-Bandirma Sulfric acid plant: This Plant which uses pyrite roastes has the capaciti of 120,000 MT/Y.

-Mersin Plants: The Sulfric acid plant which will have the capacity of 214,500 MT/Y, is about to commence production.

-Also small amounts of sulfric acid id produced in Elmadağ and Yarımca Plants in Turkey.

Pyrite and Sulphricus and roast gases are used in the manufacturing of the sulfric acids

Years	Pyrite Production	Sulfur Production
1970	88592 MT	26,760 MT
1969	124,367 "	25,700 "
1968	130,057 "	24,190 "
1967	125,01e "	25,030 "
1966	120,622 "	22,650 "

2-The Future Of the Fertilizer Industry

2.1-Estimated Production

The new plants in the 1971-72 investment program are the ammonia-urea plant of Turkish Petroleoum Company, the ammonium nitrate (Gemlik) and the DAP(Samsun) Plants of Turkish Nitrogen Industries, and the expansion of the Yarimca and

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Iskenderun Plants of Fertilizer Plants Inc. A by-product ammonium sulfate will be manufactured by the Turkish Petro-Chemical Industries' caprolactam project. Bandırma Fertilizer Industries is in the state of erecting a simple Superphosphate plant in Bandırma.

The capacities of the plants under planning and erection are as as follows:

Company	Fertilizer	Designed Capacity MT/Y x1000	Erection year
Turkish Petroleoum	Urea 46 % N	360	1972-74
Turkish Nitrogen Ind. (Gemlik)	Ammonium Nitrate 26%N	600	1972-74
Turkish Nitrogen Ind. (Samsun)	DAP 18-46-0	220	1971-73
Fertilizer Plants (Yarımca)	TSP 43%P2O5	200	1971-73
Fertilizer Plants (Iskenderun)	TSP 45%P2O5	200	1971-73
Turkish Petro-Chem. (Caprolactam)	Ammonium Sulfate 21% N	100	1972-74
Bandırma Fertilizer	NSP 18%P2O5	200	1970-72

2.2-Estimated Consumption

In 1968 crop pattern was ~~dxxx~~ prescribed regionally by the Ministry of the Agriculture and it was tryed to estimate the possible variations from these patterns until 1982 . In thes estimations, the possible applications of the new projects to the high priority crops and the possible developments in the crop patterns had been considered.

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Estimated Fertilizer Consumptions in the selected years 1982 are as follows:

Kind of Fertilizer	1972	1977	1982
		X 1,000 MT	
N	486	707	987
P2O5	400	580	781
K2O	13	16	26

3-Main Problems in the Fertilizer Industry

3.1-Raw Materials Problem

It has been confronted with so me problems in obtaining pyrite, phosphate rock and ammonia.

3.2- Price-Cost Problem

The price of fertilizer is affected abpicially by the two factors:the cost of the fertilizer and the distribution charges.

The cost of the raw materials constitutes the highest percentage of the over all cost of the fertilizer.

The distribution chargex is about 20 % of the plant delivery price.

3.3-Production of the most proper Fertilizer fod the turkish soil

The combination of the nitrogen and the phospherous based fertilizers has given good results for the big part of the crop harvested in Turkey.With respect of the compound fertilizers some detailed work is being done in the third 5-year Development Plan.

3.4-The Problem on the Spare Parts

Since the existing plants and the plants under erection use the most of the imported machinery and apparatus.IT is a major problem to have the sufficient amount of spare parts as needed.

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3.6-Qualified Worker Problem

To find and keep the exprienced and the qualified employees have been a real problem especially for the low capital returned incorporations like/owned Fertilizer companies.

Even though the courses are held to Government train the workers, these courses have not been sufficient to meet the demand. The exodus of the qualified workers to western European countries has magnified the problem.

B- The Pesticides Industry in Turkey

1-The Status of the Pesticides Industry

1.1-Production-Consumption Status

In Pesticides Industry the usable capacity differs from the actual production.The reason for this difference is that the ~~xxxxx~~ selling rate of pesticides depends on the seasonal demands.If the plants capacity is held small than it will be necessary to produce all around the year and to stock the product for seasonal demand.However,the costs of the preserving the products in this manner is much higher than the investment costs of the high-capacity plants.

In relation to above mentioned considerations,the amount of production and the usable capacity for different pesticides,in 1970,are as follows:

Main Pesticides	Usable Capacity Tons -Metric	Production per year
DRUGS		
Powdered Drugs	28,000	18,404
Hygroscopic Drugs	7,400	1,967
Liquid Drugs	27,050	4,228
Drugs for Weeds	5,310	1,303
Mineral Oils	8,350	2,710
Powdered Sulfur	20,000	17,285
Drugs for seeds	10,800	1,972
ACTIVE INGREDIENDS		
DDT	2,800	2,297
BHC	4,500	4,082

In recent years the demand for active ingrediends excluding copper sulfate and sulfur have been as follows:

Organic Synthetics	1970	1969	1968	1967
	8,051	7,883	6,840	6;124 (in m. tons)

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The Demand of Pesticides,in metric tons,in Turkey in 1970-69

Main Pesticides	1970	1969
I.Insecticides (a,b,c)	6,746	6,718
a-Organics	4,342	5,715
b-Mineral Oils	2,391	975
c-Fumigates	13	28
II.Fungicides (a,b)	532	684
a-Inorganic Compounds	93	281
b-Organic "	439	405
III.Herbicides (a,b)	761	474
Chlorinated Compounds	705	466
b-Others	56	8
IV. Molluscides	2	1
V. Rodenticides	4	-
VI. Various	8,051	7,883
VII.Copper Sulfate	1,914	2,064
VIII.Sulfur	17 ,741	19,653

1.2-Pesticides Plants in Turkey (Manufacturing Units)

1- Agro- Merck Pesticides Industries Inc.

2- Bayer Pesticides Industries Ltd. Inc.

3- Hektaş Commers Inc.

4- The Shell Company of Turkey

5- Prentive Pesticides Inc.

6- Midiltipi Pesticides Inc.

7- Chemists' Pesticides Inc.

8- BP Petroleoum Inc.

9- Sandoz Chemicals Ltd.

10- Rabak Electrolitic Copper and products Inc.

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The above mentioned factories are located in the provance Istanbul with the exception of Sandoz which is located in Izmir.

1.3- Raw Materials Status

The products,considered as semi-manufactured are produced in Turkey.

The import of raw materials,in metric tons,in 1969-1970 had been as follows:

Raw materials,for	1970	1969
ACTIVE INGREDIENDS		
I.Insecticides	4,880	4,160
II.Fungicides	220	344
III.Herbicides	684	419
IV.Molluscides	2	1
V.Rodenticides	4	-
ADDITIVES		
I.Sulfric Acid	555	1,203
II.Solvents	2,053	3,324
III.Surface Tension Preventive	467	700
IV.Formulation Improvement	472	416

From the raw materials needed for the production of inorganic pesticides sulfur partly,mercury and copper completely are obtained xx domestically.

2- The Future of the Pesticides Industry

In order to produce sufficient amount of active ingredients in every group of the pesticides industry following manufacturing units have been proposed to be established or improved.

1- Mercury based pesticides

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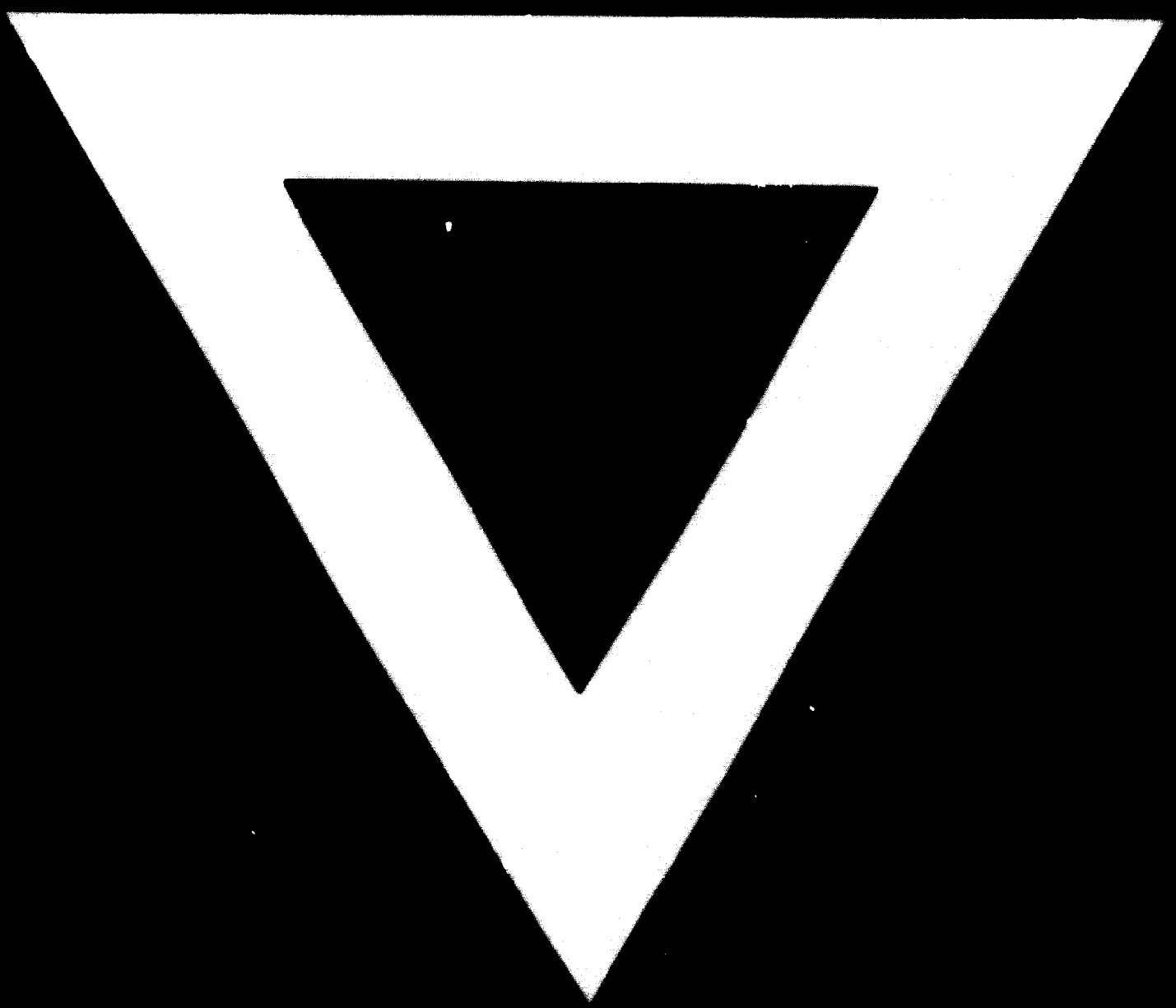
2-Mineral Oil Production
3-Copper Oxide and Copper oxychloride
4-Dithio carbamate production
5-Organic Phosphate based fungicides manufacturing Units
6-Herbicide Manufacturing Units

3-The Main Problems of the Pesticides Industry in Turkey

3.1-Training : Turkish peasants, for the time being, could not find the opportunity to be trained well enough to appreciate the pesticides.

3.2-Distribution : Even though there are enough establishments in every provence, the organisation does not function properly enough in this field.



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