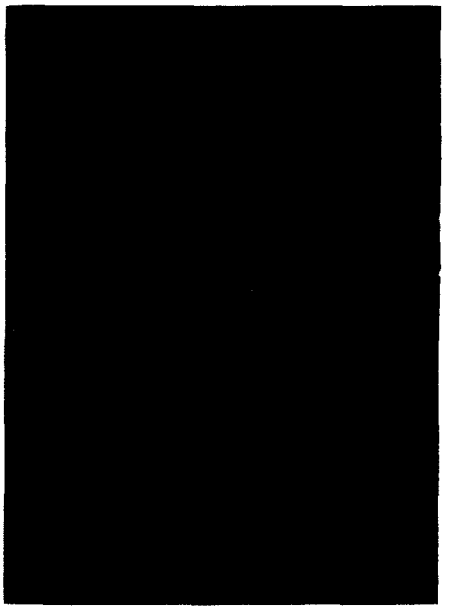
Agricultural Chemicals in the World Market



In the economic war declared by the Kremlin, the U. S. could take the humanitarian offensive by an all-out attack on insects and disease in the world's underdeveloped countries. Leadership should come from experts in the pesticides industry

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We are in a state of war. This was formally instituted the first of this year when Mr. Khrushchev said to an American visitor in the Kremlin: "We declare war upon you—in the peaceful field of trade . . . we will win over the United States." This is not a glamorous type of war with bands, massive movements of armies, and the waving of flags. It is much more subtle—and for those with a purpose, much more effective.

Its weapons are words and dollars and its battleground the villages and cities of Asia, the Middle East, and Africa. Lenin's famous doctrines still stand: "The road to Paris lies through Peking and Calcutta"—and not through frontal military attack on the citadels of Western power.

Since this is an economic war, industry is pitted against industry, and our system is only as strong as the individuals who staff its industries. Therefore our government is backed by strength in the agricultural chemical industry only to the degree that industry representatives "measure up" versus those individuals in the Soviet Bloc who are in charge of their agricultural chemical production.

Are you and your company therefore, as representatives of your industry, doing your part to protect your section of the battle line in this war?

This part of the battleground, by the way, is very important. Our opponents are drawing up their best artillery to attack this section of the front. If you have not already done so, you ought to read the Russian Embassy's Press Release No. 277, dated May 12th, entitled "Accelerating Chemical Industrial Development and Manufacture of Synthetic Materials." This document summarizes Mr. Khrushchev's report at the May Plenum of the Central Committee of the Communist Party of the Soviet Union.

The first paragraph brings to focus the objectives of our challengers. This reads as follows: "The latest discoveries in the field of chemistry offer an opportunity of making fuller use of the wealth of natural resources in the national economy, and of developing the manufacture of high grade goods from synthetic materials on an unheard-of scale *which together with a sharp upsurge in agriculture* will make possible within the next few years a supply capable of fully satisfying the growing needs of the population in clothing, footwear, and household goods."

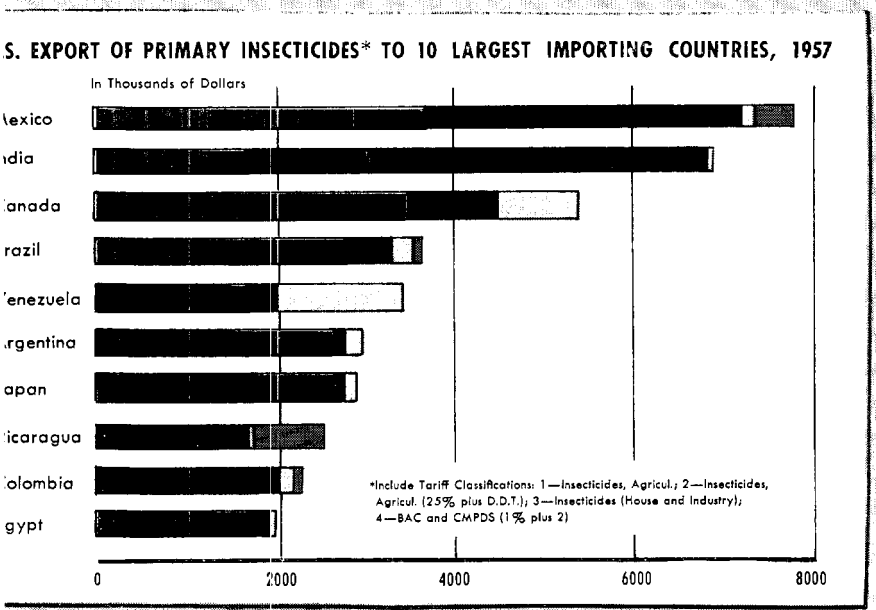
This means increased production of fertilizers, pesticides, and weed-killers. We can assume that this increased production will also be used as a tool of foreign policy—for agricultural chemicals, like pharmaceuticals, help to fill the stomachs and ease the sickness. They provide truly an important offensive weapon to be used against us on the battleground of the underdeveloped countries.

As partial preparation for this coming battle let us analyze the size of our forces (export sales) currently employed, where they are dispersed (importing countries), and insofar as is possible, our strength relative to that of the enemy.

Let us first analyze our forces. Figure 3 shows our agricultural chemicals exports to world markets last year. Here are the potential battlefields. We can expect attack in those areas in which we are strong. Where we are currently weak, we know that we will have to employ more vigor and aggressiveness. We will have to establish our beachhead more firmly in these areas to prevent their being completely taken over by the coming offensive of our adversary.

As a matter of interest, the total of $189,055,000 in agricultural chemical exports accounted for approximately 14% of total U. S. exports of all chemical products last year. Of the total of agricultural chemicals exported, 56% was in fertilizers, 40% was in insecticides, and 4% was in weed-killers.

Figure 4 compares U. S. fertilizer exports in 1956 with the Soviet Bloc's exports to selected importing countries. This, of course, does not show the relative strength of our forces, as


S. EXPORT OF PRIMARY INSECTICIDES* TO 10 LARGEST IMPORTING COUNTRIES, 1957
In Thousands of Dollars
lexico
ıdia
anada
razil
enezuela
rgentina
apan
icaragua
olombia
gypt
0
2000
4000
6000
8000
*Include Tariff Classifications: 1—Insecticides, Agricul.; 2—Insecticides, Agricul. (25% plus D.D.T.); 3—Insecticides (House and Industry); 4—BAC and CMPDS (1% plus 2)

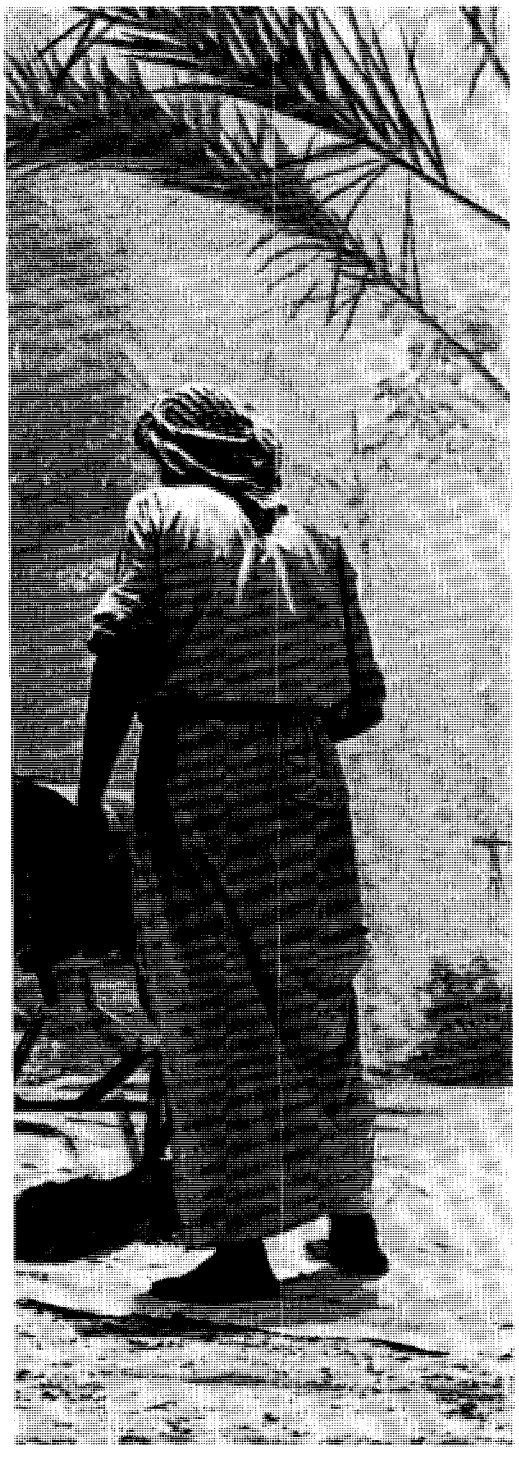
Iraqi date growers hand-mix a dust of nicotine, lime, and ash to kill date-

it does not compare total U. S. exports versus total Soviet Bloc exports. However, it does show our relative position in those countries to which the Soviet Bloc is today exporting. These are listed in descending order, showing their largest purchaser to be Japan (where we more than hold our own), and their smallest purchaser Yugoslavia (where we do not export any materials).

It is generally accepted that the U. S. fertilizer industry does not have too much to worry about in competition from the U.S.S.R. in export trade. This feeling is supported by current statistics which show that U. S. exports are at least three times as great in dollar volume as the U.S.S.R.'s. However, Figure 2 should jar a few of us out of our complacency. This is a comparison of fertilizer production in the U. S. A. versus the U.S.S.R., based on 100% nutrient value. The 1957 preliminary, and the 1958 and 1965 estimated U. S. A. figures are from the U. S. Department of Agriculture. The 1959, 1960, and 1964 estimates for the U.S.S.R. have been calculated from figures set as objectives by the Russian government.

Here it is important to note that if the Russians accomplish their expected plans (and in the past they have done very well in meeting their proposed fertilizer objectives), we should expect that by 1965 the U.S.S.R. will be producing as much fertilizer as the United States on a plant nutrient basis.

The vertical lines on the U.S.S.R. graph pertain to various five-year



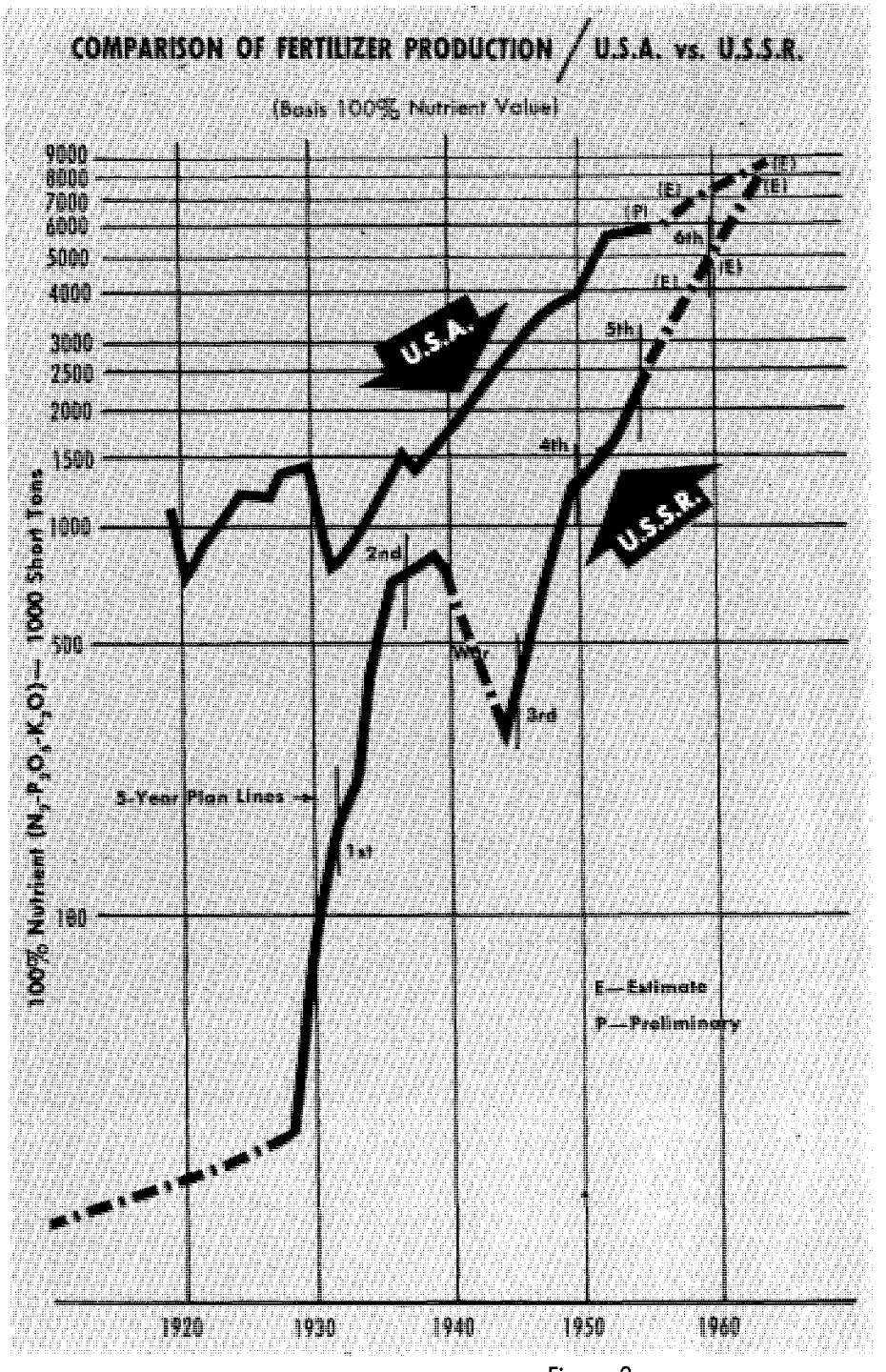


Figure 2

palm insect pests, a technique taught through U. S. technical assistance

plans. During the first five-year plan (1928–32) the still greatly insufficient productive capacity of the U.S.S.R.'s fertilizer industry was increased by modernizing old superphosphate plants and constructing several new ones. The utter dependence on foreign sources of raw materials was considerably reduced by discovery of high phosphate apatite deposits in the Kola peninsula. Production of nitrogenous fertilizers of any consequence began during this five-year plan.

During the second five-year plan (1933–37) new plants were constructed for increased efficiency and improved product quality. Production of potassium fertilizers was started, and special emphasis was placed on expanding production of nitrogenous fertilizers. Extremely rich phosphate rock deposits were discovered in south Khazakstan, but their exploitation did not begin until the third five-year plan.

During this third five-year plan, cut short in 1940 by World War II, most efforts were devoted to improving fertilizer quality. Phosphate concentrates, double superphosphate, ammonium phosphate, and urea were produced in increasing quantities. The outbreak of World War II, which necessitated conversion of the nation's industry to war production, caused a severe decline in fertilizer output.

The earlier part of the fourth five-year plan (1946–50) served for reconversion of the war industry to peace economy, and several years were required for fertilizer production to reach its prewar levels. This five-year

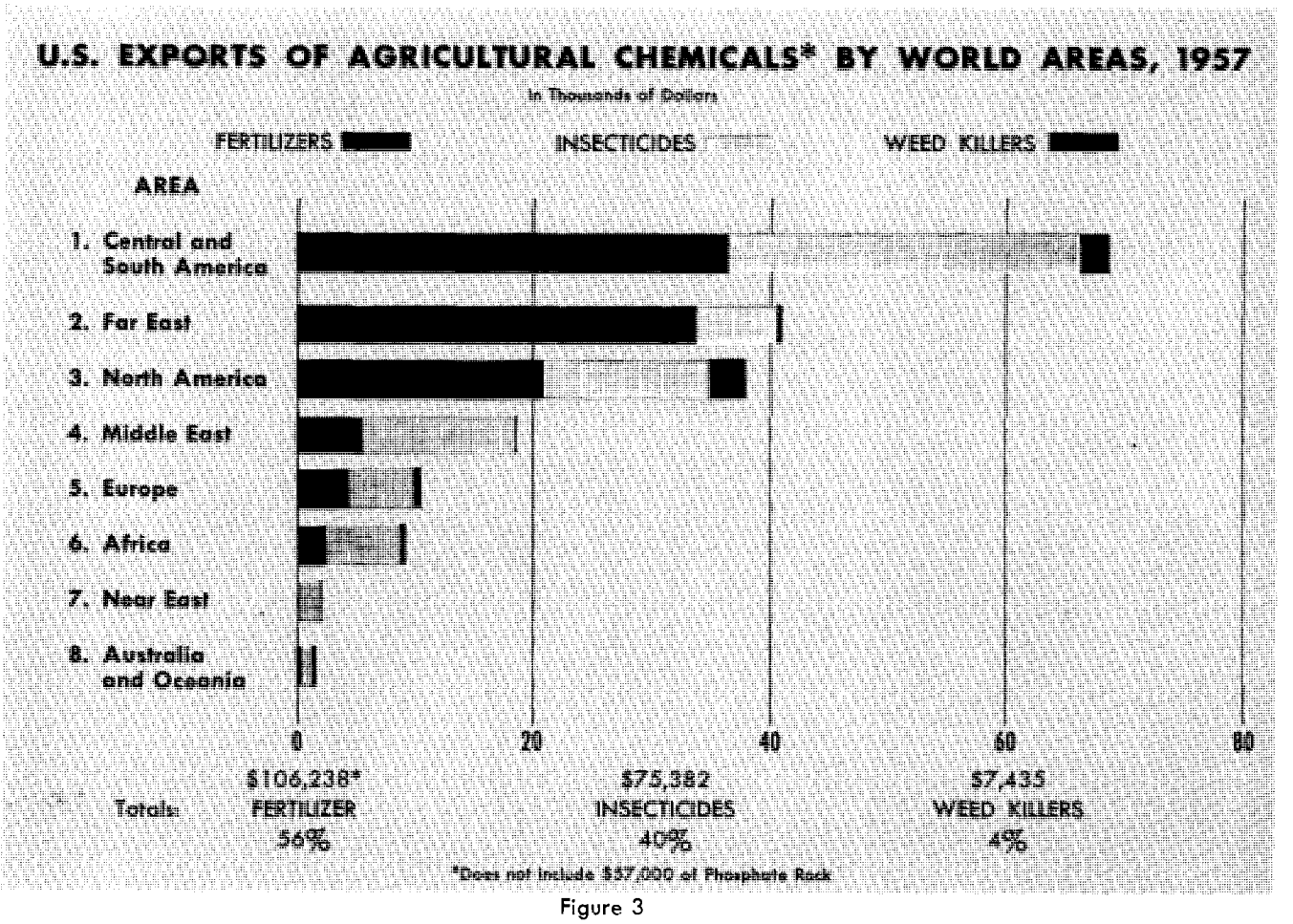


Figure 3

plan was designed as the "chemical industry plan," and increased emphasis was placed on development of all branches of the chemical industry. The fertilizer industry enjoyed a particularly favored position in this overall increase. Fertilizer factories were constructed all over the nation. Total fertilizer production increased 70% from 1940 to 1950. Biggest increase was in nitrogenous fertilizers which increased 97%, principally through construction of new plants in the Ukraine, on the Caucasus, and in Siberia. Production of phosphates was increased 74% by the addition of new plants in Asiatic areas, and potassium fertilizers, a relative newcomer in the industry, increased 41%.

The fifth five-year plan (1951–1955) was marked by a trend toward increased production of consumer goods. Fertilizers, as an essential part of food production, were again slated for large increases. An 88% production boost over 1950 levels was planned for 1955. New plants were built in the Ukraine, in Asia, and in the Baltic states. Improvements in production processes resulted in better quality; granulated superphosphate production was started, and superphosphate concentrates were increased. During the fifth five-year plan the approximate breakdown of phosphate fertilizers by type was: normal superphosphate 53%, double superphosphate 9%, precipitate 7%, ammonium phosphate 2%, fluorine-free phosphate 6%, ground phosphate rock 23%. In addition to increasing the quantity and improving the quality of fertilizers, the plan envisaged the introduction of a wider assortment of fertilizer types, increasing their selection from 7 to 20.

Despite the enormous growth of fertilizer production, the U.S.S.R.'s domestic requirements are still not being fully satisfied. Further increases in production as well as improvement of quality are planned for the coming years, as evidenced by Figure 2.

More emphasis is to be placed on development of nitrogenous and potassic fertilizers. In the nitrogenous group the production of nitrophosphates and of sodium, calcium, and calcium-ammonium saltpeter is to be developed; the potassic group is to include potassium chloride, and chlorine-free potassic fertilizers, such as potassium-magnesium sulfates.

Let us now consider the foreign pesticide market, first analyzing the Russian industry.

Meaningful information and statistical data on Soviet production of pesticides of all types are quite scant. Growth of the pesticide industry in the U.S.S.R. can, therefore, be traced only in very general lines. As in the case of fertilizers, the impetus for growth has been imparted by the five-year plans.

During the first five-year plan (1928–1932), production of pesticides was limited primarily to simple inorganic compounds. The assortment of pesticides comprised sodium fluoride, arsenic, barium chloride, Paris green, blue vitriol, carbon disulfide, and the newly introduced borax.

During the second five-year plan (1933–1937), production was expanded both in quantity and in assortment. The production of Paris green, blue vitriol, barium chloride, and carbon disulfide was increased, and calcium arsenate was added to the array of economic poisons.

No information could be located on the pesticide industry during the third five-year plan and immediate postwar years. It can be assumed, however, that the beginning of DDT production dates to this period.

The "chemical" emphasis of the fourth five-year plan (1946–1950) and the recent emergence of organic pesticides resulted in particular interest in the development of organic pesticides planned for this period.

Goals of the fifth five-year plan (1951–1955) were a 100% increase in production of DDT, hexachlorane (BHC), and granosan (ethyl mer-

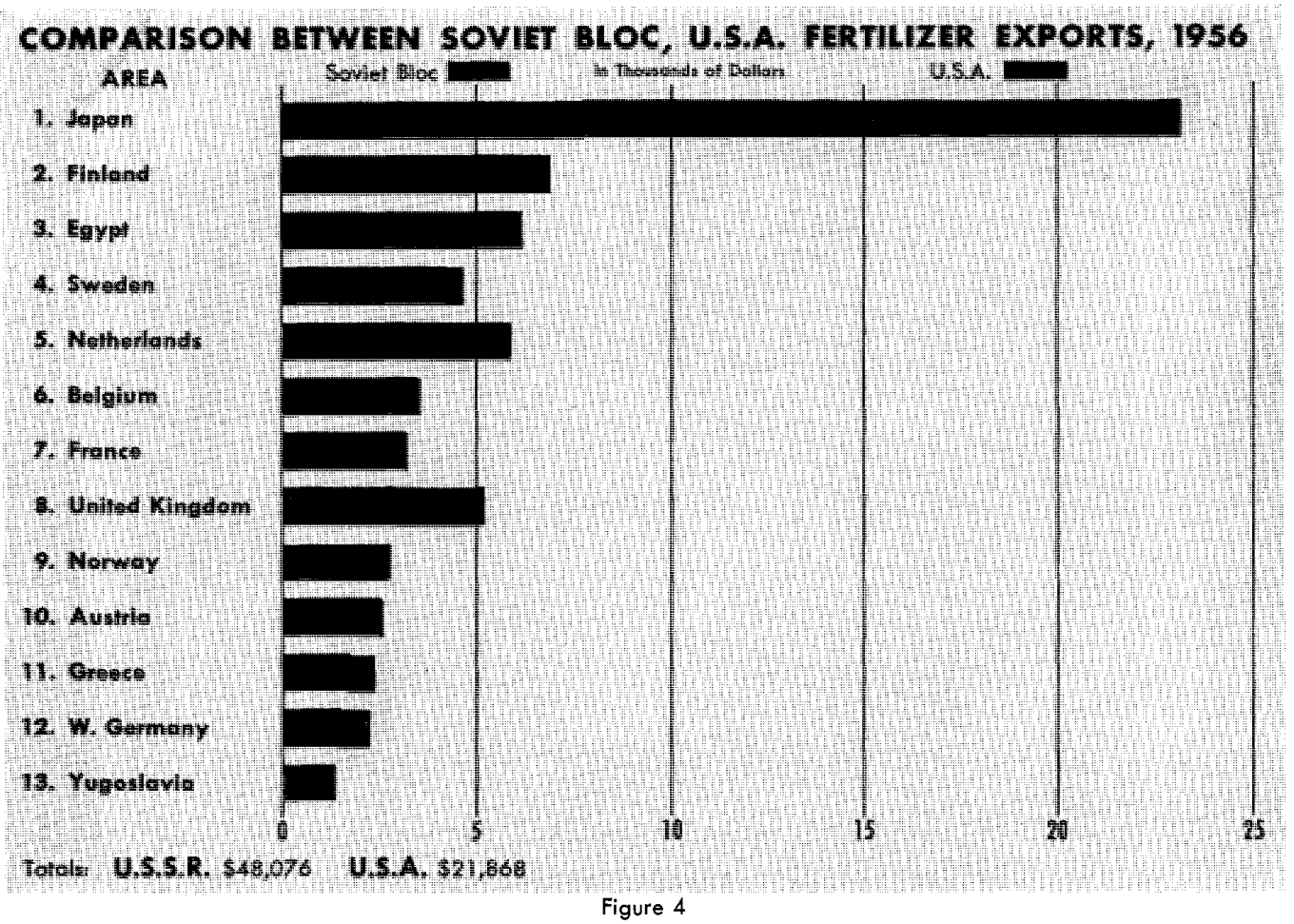


Figure 4

curic chloride), and initial production of organic phosphate compounds.

Reportedly during the course of these five-year plans, production of pesticides has been increasing yearly. The quality has improved enormously.

Some insecticides currently available in the U.S.S.R. are anabasine sulfate (closely related to nicotine), calcium arsenate and arsenite, sodium arsenite, barium chloride, Vofatox (methyl parathion), hexachlorane (BHC), DDT, ethylene dichloride, carbophos I concentrate (malathion), mercurane (a seed treatment containing mercury and lindane), mercaptophos concentrate (approximating our Systox), sodium fluoride, sodium fluosilicate, sodium cyanide, nicotine sulfate, NIUIF-100 "Thiophos" (parathion), octamethyl (OMPA), *p*-dichlorobenzene, Paris green, carbon disulfide, chloropicrin (stored grain and soil fumigant), and methyl bromide.

Fungicides include blue vitriol, sodium carbamate (Nabam), copper chloride, AB mixture (basic copper carbonates and sulfates), granosan (NIUNF-2) (ethyl mercuric chloride), sulfur and its basic compounds, tetramethyl thiuram disulfide (thiram), copper trichlorophenate, and formalin (formaldehyde).

A nematocide is compound 23 (dimethyl thiocarbamino ethyl ether).

U. S. entomologists F. P. Hubert and W. O. Ridgway (left) show Iraqi plant quarantine trainees how to operate a locally constructed drum-type atmospheric fumigating chamber that dispenses methyl bromide for killing insects

Herbicides are 2,4-D, dinitro-*o*-cresol (Sinox), and isopropyl phenylcarbamate (IPC).

Rodenticides include zinc phosphide and chryside (α-naphthyl thiourea) (Antu).

Now let us analyze our own foreign shipments.

The 1957 total of U.S. exports of insecticides, $75,382,000 (Fig. 3), is broken down below in descending order of the U. S. Tariff Classifications. Here it is to be noted that the four major insecticide groupings, 1, 2, 4, and 5, compose a subtotal of primary insecticides of 78% of the total.

U. S. Exports of Insecticides (1957)

(Values in $1000's)

1.	Insecticides, agricultural	$40,671
2.	Insecticides, agricultural (25% plus DDT)	17,872
3.	Copper sulfate	6,534
4.	Insecticides (house & industrial)	5,804
5.	BHC and cmpds. (1% plus γ)	2,133
6.	Sulfur formulations (20% plus)	637
7.	*p*-Dichlorobenzene	396
8.	Nicotine sulfate	374
9.	Agricultural sulfur	335
10.	Lead arsenate	231
11.	Calcium arsenate	201
12.	Pyrethrum extract	194

Figure 1 shows these primary insecticide exports broken down in descending order for the 10 leading importing countries. These 10 countries accounted for 53% of total U. S. insecticide exports last year.

Figure 3 showed total U. S. herbicide exports of $7,435,000 in 1957. Distribution of these exports to the 10 top importing countries is shown in descending order of importance below.

U. S. Exports of Weed Killers (1957) to 10 Largest Importing Countries

(Values in $1000's)

1.	Canada		$2842
2.	Cuba		683
3.	Colombia		681
4.	Venezuela		472
5.	U. of S. Africa		264
6.	Argentina		219
7.	France		213
8.	Costa Rica		198
9.	New Zealand		159
10.	Dominican Republic		104
Subtotal 1st 10		$5835	79%
Remaining		1600	21%
Grand total		$7435	100%

Canada obviously makes up the predominant foreign market for these products, with Caribbean and Central American countries offering the next largest area market.

Where, Then, Do We Go from Here?

We can conclude that our enemy is rapidly approaching us in offensive capacity, and we now should have some idea where he will strike. We also know that he has already started probing our defenses.

We have it on excellent authority that during the 1958 season Russia presented a well known Middle Eastern country with 11 spray planes and 49 pilots—all free of charge, as a token of Russian interest in that country's welfare. Combined with this was a donation of 350 tons of 2.5 gamma BHC. One thousand additional tons of BHC was to be prepared and shipped on request. As this country could not use even the first 350 tons this season, large tonnage will remain in the warehouse. It will most likely affect to a great degree the purchasing policy of the country's minister of agriculture for next season. The beachhead has been established!

Our own Government, with the help of our industry, has also been active

Iraqi plant quarantine officials, with help of U. S. experts, learn to recognize foreign pests in order to keep them out of Iraq

The first airplane to land and take off from the shores of the Dead Sea was spraying insecticides to control mosquitoes. USDA entomologists are demonstrating modern insect control methods in the Middle East, South Asia, and Africa

in this area. Arrival of a rushed shipment of U. S. insecticide for a large locust invasion in Iran (just before the arrival of Russian material) resulted in well-publicized U. S. aid which certainly did much to assist our foreign policy in that area of the world.

But this is only protecting our flanks. What about our offensive?

In broad strokes I should like to offer for consideration the suggestion that the leaders of our pesticide industry and of the pharmaceutical industry, through our associations prepare a plan for a humanitarian offensive on the underdeveloped countries of the world—this to be spurred by our government through a tax incentive arrangement to encourage the export of not only our products, but also our know-how and capital.

Here, briefly, is how such a plan might work. A detailed survey of the underdeveloped countries by insect, crop, and disease could be conducted by special task forces organized by the trade associations. The survey's purpose would be to conclude what the current crop yields and health standards are, and then to project what is required for satisfactory living conditions. Task force personnel would work closely with the United Nations. The individuals involved would be recruited from the experienced personnel employed by member companies. After the needs were ascertained, the groups would write specific proposals as to the type of imported products immediately needed; for the long range, they would recommend what type of formulating (or pharmaceutical manufacturing) operations should be set up, and by what scheduled time. Companies could then be organized to follow through with these opportunities, using U. S. and local capital contributions.

Progress could be spurred by a government tax policy which would allow the U. S. companies to deduct from their corporate tax the direct cost of their participation in the plan. The companies should also be assisted (through tax credits) to meet any additional costs of technical service, extended credit terms, or artificially depressed prices required to meet competition dictated by Russian foreign policy. There should also be a tax incentive to encourage U. S. companies to promote the eventual foreign manufacture of their products by companies in which they would share stock ownership with the local citizenry.

The cost of this program to our Government (in decreased corporate tax revenue) could be defrayed with funds from the current foreign aid allocation. This program, of course, would have to be coordinated with our foreign policy, but being executed on an industry basis, it should remove the possible stigma of formal U. S. government intervention in other countries' local affairs.

This may be a very naive plan of action. But the degree of acceptance of "Liberty" as a way of life can be correlated with the degree of health and hunger of a country's populace. We, as a people, had better do something about it before it is too late, for if "Liberty" is not chosen, communism will fill the vacuum.

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